INDIA RUBBER WORLD

APRIL, 1945

TECHNOLOGY DEPT.

EPC Spheron-9
MPC Spheron-6
HPC Spheron-4
CHANNEL

SRF Sterling-S
HMF Sterling-L
FURNACE

cabot

Newsletter No. 4
APRIL, 1945

Published by Rubber Chemicals Division of DU PONT

PROMPT USE OF NEOPRENE WILL AID PROCESSING

NEOPRENE processes best when reasonably fresh, but as it ages it becomes more plastic. Its rate of cure increases and it develops stickiness during processing. These changes are intensified during warm weather when the temperature of storage is elevated. Hence, it is important to use reasonably fresh neoprene.

Production of neoprene at Louisville Kentucky, and at Carney's Point, New Jersey, is now controlled and adjusted to the existing demand and allows only for sufficient inventory to facilitate prompt shipment of orders. Rubber manufacturers can take advantage of this situation and will find that many processing difficulties can be avoided by adjusting purchases so that the amounts of inventory carried at their manufacturing points do not exceed a three weeks' working supply. This procedure will be especially important during the summer months.

Both GR-M and GR-M-10 are produced at Louisville, Kentucky. GR-M-10 contains 1% of an antioxidant stabilizer (not present in GR-M) and, although it softens with age almost as much as GR-M, it does not develop nearly so much undesirable stickiness. For many applications, especially in calendering and extruding, GR-M-10 is preferred to GR-M because of its better processing. Because it contains an antioxidant, it darkens on exposure to light. GR-M-10 is recommended for any use except in white and light-colored stocks or in contact with goods which are sensitive to staining by the presence of an antioxidant. If you are not using GR-M-10, investigate it now and plan to use it this summer.

To maintain good processing neoprene stocks:

1. Order only as much neoprene as you will use.
2. Carry a minimum inventory.
3. Use oldest lots first.
4. Use GR-M-10 especially for difficult processing jobs, except if white or light-colored.

NEOPRENE GR-M AND GR-M-10 are supplied by Rubber Reserve Company, Louisville, Kentucky. Purchase permits from Rubber Reserve Company, Washington, D. C., are required.

NEOPRENE TYPES E, M, CG, FR, KNR, and Latex are supplied by Rubber Chemicals Division of E. I. du Pont de Nemours & Company (Inc.), Wilmington 98, Delaware. For these, orders certified under Rubber Order R-1 are required. No purchase permits are needed.

BACK THE ATTACK WITH WAR BONDS

DU PONT

RUBBER CHEMICALS DIVISION

BETTER THINGS FOR BETTER LIVING . . . Through Chemistry

INDIA RUBBER WORLD, April, 1945, Vol. 112, No. 1. Published monthly by BILL BROTHERS PUBLISHING CORP., 386 Fourth Avenue, New York 16, N. Y., U. S. A. Entered as second-class matter December 27, 1944, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Subscription, United States and Mexico, $3.00 per year; all other countries, $4.00; single copies, 35 cents.

AQUEOUS DISPERSIONS...

to meet your problems!

Over his shoulder, you see some of the *usual* applications of Flintkote SYNTEX Rubber Products.

If your requirements are not on this list... and you need something *unusual* to improve your processes and products, perhaps Flintkote can help you find the answer.

So... if it's a question of bonding, impregnating, coating, or something special... let us explore your problem thoughtfully together.

Flintkote technicians will welcome the opportunity to work right along with your staff, from laboratory to finished commodity. Our long experience in formulating and compounding water dispersions for many varied requirements has given us a fund of valuable data that should be of great advantage in solving your difficulties.

Many of the new possibilities in synthetic dispersions, and other fluid rubber and resin products... due to continuous development of their properties... have their origin in Flintkote research.

How this research can help your business should be investigated carefully. All our facilities... research, engineering, development and manufacture... are at your service. Ask us to send a representative. There's no obligation.

FLINTKOTE
INDUSTRIAL PRODUCTS

SYNTEX PRODUCTS

THE FLINTKOTE COMPANY *Industrial Products Division* • 30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Atlanta • Boston • Chicago Heights • Detroit • Los Angeles • New Orleans • Washington • Toronto • Montreal

PHILBLACK A...NO extra PASSES!

A fast-working smoothie! Even with short mixing cycles, Philblack A stocks tube smoothly, splice well, and give that rubbery feel so difficult to obtain with other blacks. This ability to *rapidly* remove the nerve of synthetic rubber stocks is one of the reasons why Philblack A is so desirable for excellent mold flow, frictioning and calendering.

As the result of many successful road tests with a number of fleets, Philblack A is being widely used in the manufacture of tires: for carcass, side wall, and tread... because Philblack A combines high reinforcement and low hysteresis with excellent abrasion.

And now, of greatest interest is the outstanding feature that Philblack A imparts these desired properties with minimum loadings.

PHILLIPS PETROLEUM COMPANY
Philblack Division
First Central Tower • Akron, Ohio

SPEED · SAFETY · ECONOMY
IN
ACCELERATION FOR WIRE INSULATION
WITH **GR-S**

Naugatuck Chemical offers some practical suggestions for wire insulation compounds cured in "C.V." units. They may also be adapted to pan or reel cures.

(Two Recommendations for Each Type are Given)

CURATIVES			TYPE COMPOUND			
Based On 100 R.H.C.	CODE		PERFORMANCE GRADE		JACKET STOCK	
SULFUR	2.5	2.5	2.5	2.5	2.0	2.0
MBTS	0.75		0.85		1.0	
METHAZATE	0.75		0.85		1.0	
MORFEX 33		2.0		2.0		
BJF						1.5
MONEX						1.0

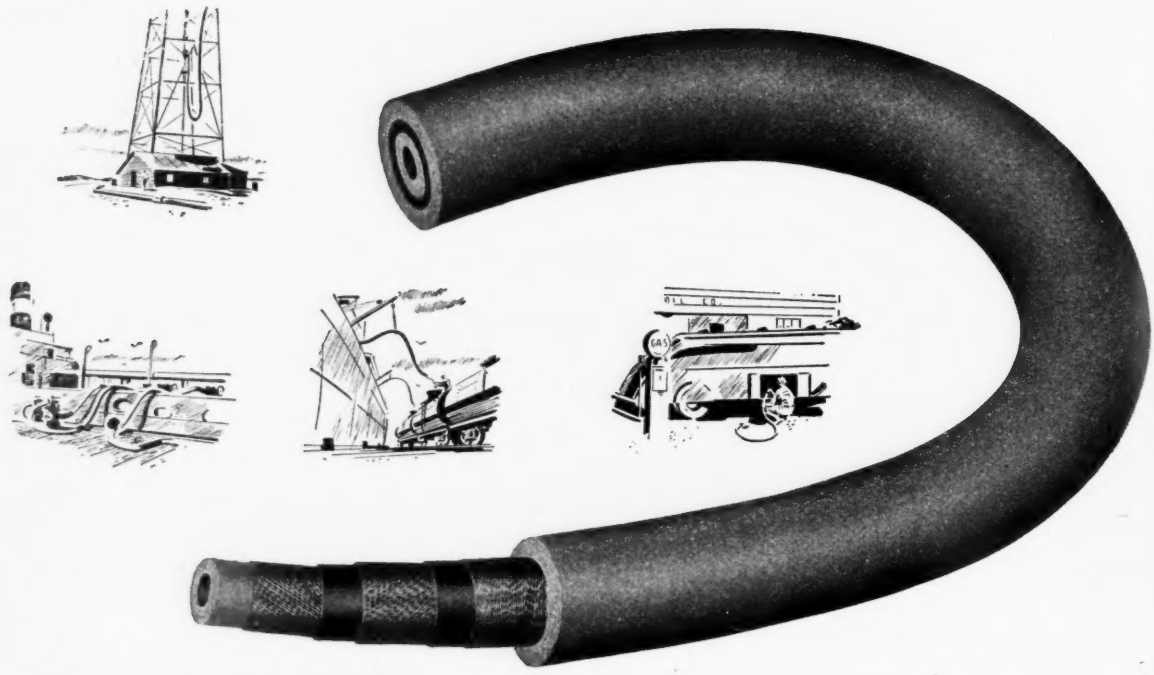
The Performance Grade Recommendations Meet
THE REQUIREMENTS OF DOUBLE CURE FOR JACKETS

Write for special bulletins on wire compounding

•

PROCESS · ACCELERATE · PROTECT
WITH
NAUGATUCK CHEMICALS

Naugatuck Chemical
DIVISION OF UNITED STATES RUBBER COMPANY
ROCKEFELLER CENTER NEW YORK 20, N. Y.
IN CANADA: *Naugatuck Chemicals Division, Dominion Rubber Co., Elmira, Ont.*



BACKBONE...
For a High Pressure Hose

OIL well rotary drilling hose has to take pressures up to 5,000 pounds, stand up under constant flexing and re-flexing, carry heavy volumes of fast-flowing mud to lubricate the drilling. It takes plenty of *backbone* to hold up under that kind of strain, and so in this hose, as in many other types, the backbone is steel wire.

Only the highest quality steel *wire* can provide the necessary reinforcement for strength and long life . . . its use in fabricated form helps provide the highest degree of flexibility necessary for this rugged service.

That's why most leading hose manufacturers have consistently specified braided *steel wire* especially developed with essential characteristics for hose reinforcement.

Developing and producing that kind of wire has been National-Standard's main job since the early days of the rubber industry. Close cooperation between rubber engineers and National-Standard wire experts has resulted in uniform high quality wire for many types of hose, brought forth time-saving, cost-reducing machinery for the application of wire into finished products, and has lead to many *new* uses for wire with rubber. Tires, airplane de-icers, conveyor belts, V-belts, and tubing are only the beginning of even greater wire-and-rubber developments to come.

If you have plans for product improvement or development, let National-Standard's experience help with a type of wire and method of application specifically fitted to your product.

BUY AND KEEP WAR BONDS

NS
NATIONAL-STANDARD Company
NILES, MICHIGAN

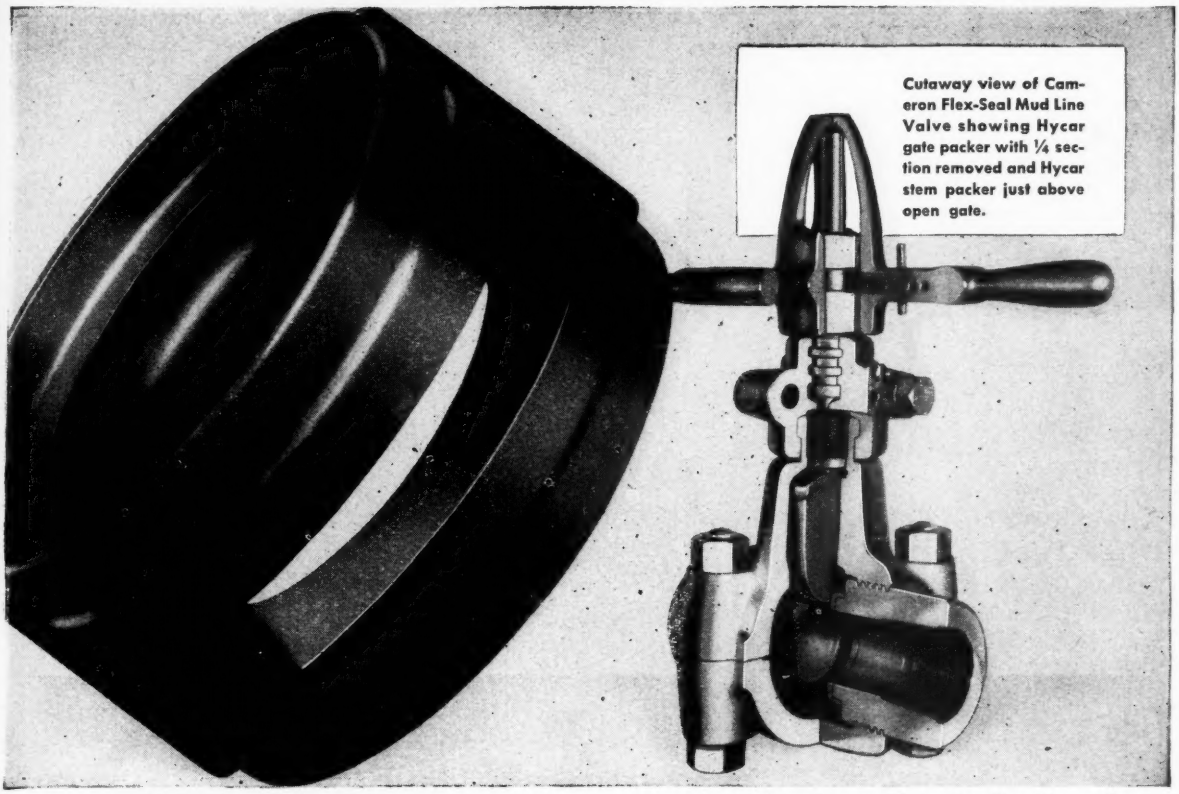
Divisions of National-Standard Company

NATIONAL-STANDARD
Niles, Mich.
TIRE WIRE, FABRICATED BRAIDS AND TAPE

ATHENIA STEEL
Clifton, N. J.
COLD ROLLED, HIGH-CARBON SPRING STEEL

WAGNER LITHO MACHINERY
Hoboken, N. J.
LITHOGRAPHING AND SPECIAL MACHINERY

WORCESTER WIRE WORKS
Worcester, Mass.
ROUND STEEL WIRE, SMALL SIZES



Cutaway view of Cameron Flex-Seal Mud Line Valve showing Hycar gate packer with ¼ section removed and Hycar stem packer just above open gate.

Closeup of Hycar Gate Packer.

Photographs courtesy Cameron Iron Works, Houston, Texas.

SATISFY TOUGH CUSTOMERS — USE HYCAR FOR TOUGH JOBS

OIL well drilling mud, moving at high velocity, quickly cuts the metal-to-metal seal usually found in conventional mud line valves. When this damage occurs, the ordinary valve must be removed and sent to a shop for repairs, requiring extra time and expense.

Engineers of the Cameron Iron Works, makers of the valves, solved this problem perfectly by using a gate packer made of Hycar synthetic rubber. Exhaustive tests proved that it was by far the best material available for this grueling service. Of course, Hycar is also used for the stem packer.

This is just one example of how men in the rubber industry are taking advantage of Hycar's unique properties to solve tough problems and satisfy exacting customers. Many of your present or potential customers have seen an abundance of evidence that products made from Hycar consistently outperform other synthetic rubber parts in a wide variety of services. They like Hycar and will ask for it—now and in the future. Capitalize on this increasing acceptance for Hycar in industrial rubber products—make Hycar the standard special-purpose rubber in your plant.

Hycar's technical service staff will be glad to cooperate with you on every phase of your synthetic rubber work — compounding matters or processing methods—new ideas or old applications—tough problems or routine production. *Hycar Chemical Company, Akron 8, Ohio.*

Our new booklet, "Everywhere in Industry" is being distributed to engineers, designers, and manufacturers in many different fields. We will be glad to furnish a copy for each member of your sales force—it will help them make better sales that will insure satisfied customers. Just let us know how many you need.

Hycar

Reg. U. S. Pat. Off.

LARGEST PRIVATE PRODUCER OF BUTADIENE TYPE

Synthetic Rubbers

It pays to be adaptable!

After the war, Crown Zipper engineers will adapt—or if necessary, *create*—special applications to meet special needs!

A lot of old-fashioned notions were exploded when Crown Zipper engineers went into the field with our armed forces to adapt zippers to military jobs.

Crown engineers proved that zippers can be big and tough yet easy to operate, small and dainty yet virtually indestructible!

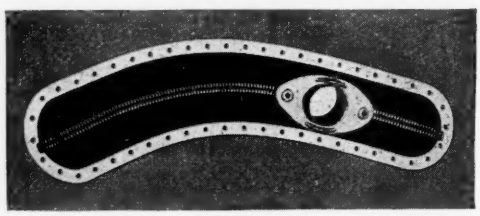
They proved zippers can be made that actually slide freely around sharpest curves!

They proved two or more sliders can be put on the *same* zipper track—to provide openings at any given point with smooth closures in both directions!

In fact, they made more big, important improvements in zipper design than anyone dreamed possible. (See complete list of Crown superiorities below.)

But perhaps the most important thing they proved is that zipper designs don't *have* to be "frozen"—zippers can be *adapted* to the *job!*

When *you* turn to postwar, Crown engineers will be able to show you exactly what this means in terms of longer zipper life and easier operation in rubber goods applications. Crown engineers will adapt—or, if necessary, *create*—special Crown Zippers to meet your own individual manufacturing problems!



"DOUBLE-ACTING" CROWN ZIPPER ON AIRCRAFT GUN TURRET OPENS AHEAD OF GUN OPENING, CLOSES BEHIND IT.

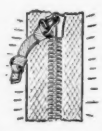
CROWN ZIPPERS are 5 ways better

1. Takes sharp curves

2. Die-cast for smoother action—extra strength

3. Provides opening wherever you want it

4. Won't lock open



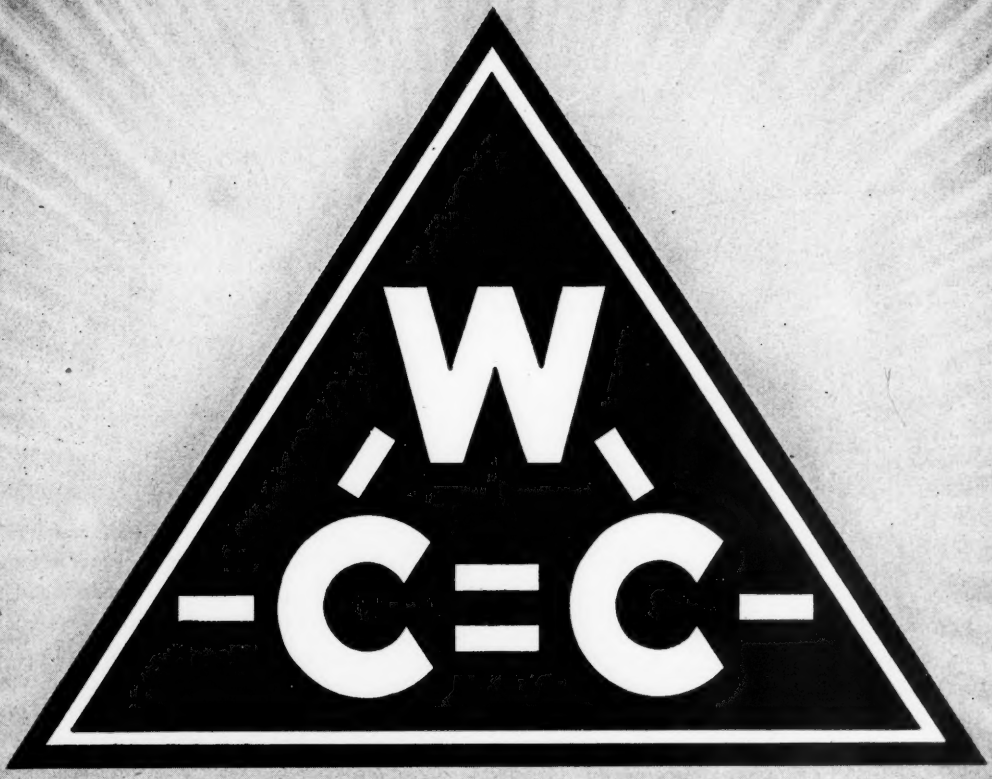
5. Resists corrosion

Member of the J. & P. Coats • Clark's ONT *Family*

THE SPOOL COTTON COMPANY • *745 Fifth Avenue, New York, N. Y. (Crown Fastener Division)*

THE TRADE-MARK OF

WILCHEM PRODUCTS



REG. U. S. PAT. OFFICE

MATERIALS OF MERIT FOR THE HIGH POLYMER FIELD. THE LATEST . . .

SYNVAR RESINS

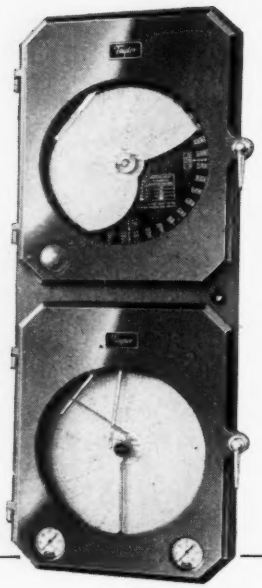
All types of urea and phenol formaldehyde resins

WILMINGTON

CHEMICAL CORPORATION

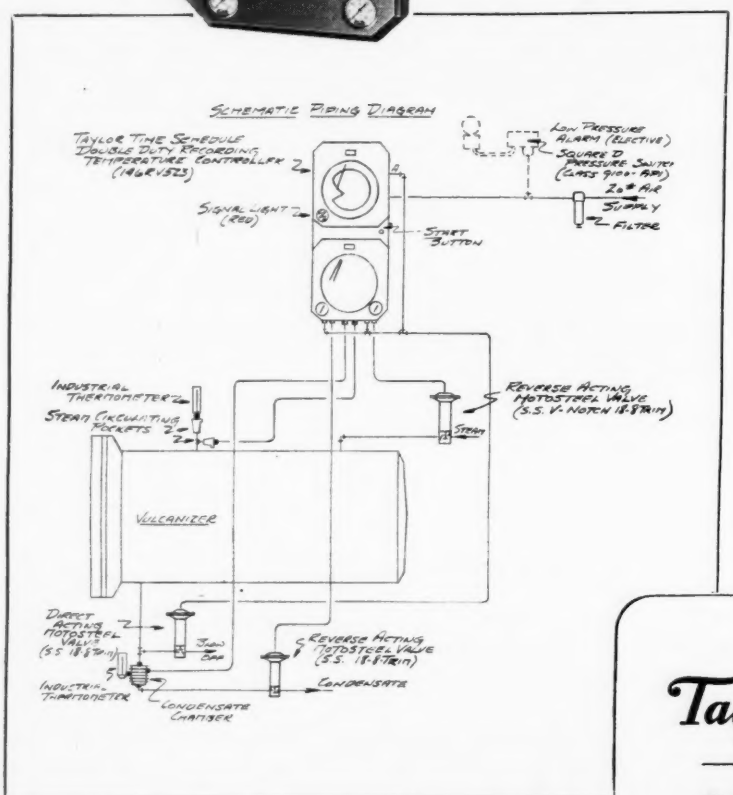
10 EAST 40TH STREET • NEW YORK 16, N. Y.

How to make SYNTHETIC rubber act NATURAL!



EVERYBODY knows there are more headaches in curing synthetic rubber than natural rubber—but this vulcanizer control system does away with a lot of 'em! When your curing cycle has been determined, just load the vulcanizer and push the button—the Taylor Time Schedule Controller does the rest! Here's what this particular set-up for horizontal vulcanizers gives you:

1. **Push-button starting**
2. **Controlled rate of rise to curing temperature**
3. **Curing time adjustable in 1 to 6 ratio**
4. **Discharges condensate throughout cure**
5. **Shuts off steam at end of cure**
6. **Opens blow-down valve**
7. **Cam stops at starting position for next run**



We're proud of the Taylor Time Schedule Controller because it's one of the most versatile and flexible instruments ever made. And it works equally well on vertical vulcanizers. In fact, it does *every* job with the same typical Taylor Accuracy! Call your Taylor Field Engineer for more details. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording, and controlling temperature, pressure, humidity, flow and liquid level.*

BUY MORE WAR BONDS AND KEEP 'EM!

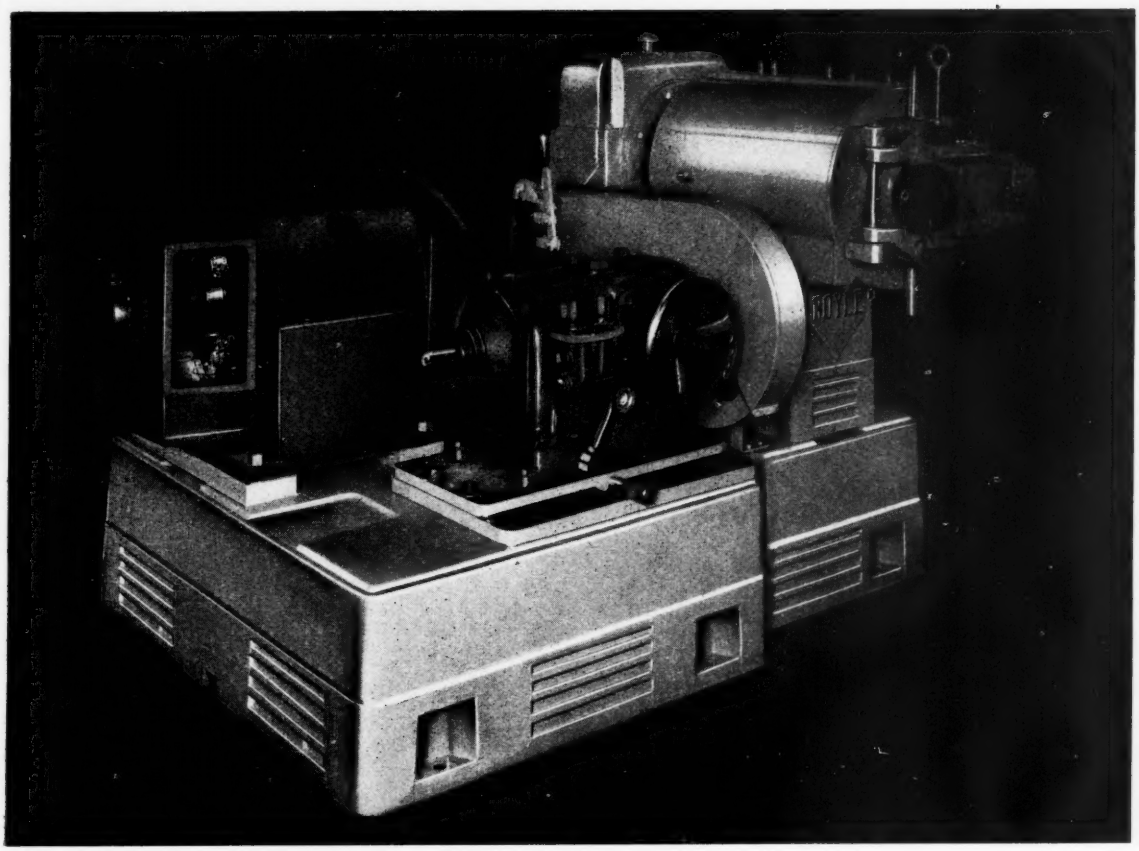
ARMY ★ NAVY

Taylor Instruments

MEAN

ACCURACY FIRST

IN HOME AND INDUSTRY



65 Years of Progressive Pioneering

Beginning with the invention of the screw-type machine in 1880 John Royle & Sons have constantly pioneered in the development of continuous extrusion equipment.

Essentially the continuous extrusion process hasn't changed a great deal. There have been refinements—the most apparent being in the field of temperature control and in the development of accessory equipment.

Sixty-five years of progressive pioneering have produced a wealth of knowledge and experience. This "know how" is built into Royle equipment—reflected in performance records.

JOHN ROYLE & SONS

ROYLE PATERSON N. J.

PIONEER BUILDERS OF EXTRUSION MACHINES SINCE 1880

James Day (Machinery) Ltd.
London, England
REgent 2430

Home Office
B. H. Davis J. W. VanRiper
SHerwood 2-8262

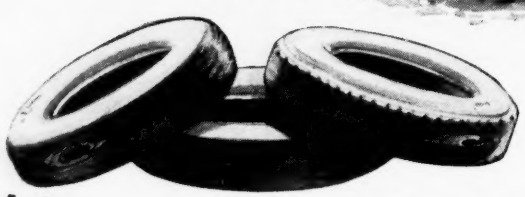
Akron, Ohio
J. C. Clinefelter
UNiversity 3726

PATERSON 3, NEW JERSEY

mechanicals

B.R.T.*

for footwear



reclaim

DUAL PURPOSE SOFTENERS AND EXTENDERS

SPECIFICATIONS

	B.R.T. No. 3	B.R.T. No. 4	B.R.T. No. 7
Specific Gravity			
25°C/25°C	1.15 to 1.20	1.15 to 1.20	1.20 to 1.25
Specific Viscosity, Engler			
50 ml at 40°C	13 to 18		
50 ml at 50°C		15 to 30	
50 ml at 100°C			6 to 9
Insoluble in Carbon Disulfide			
% by weight	4 to 10	4 to 10	15 to 20
Water			
% by volume (maximum)	3	3	0.1
Distillation			
to 170°C % by weight (maximum)	5	2	1
to 270°C % by weight (maximum)	25	20	13
to 300°C % by weight (maximum)	35	30	25
Softening Point			
Ring and Ball Distillation Residue at 300°C Degrees Centigrade	30 to 60	35 to 65	35 to 65

Through his selection of B.R.T. softeners, the rubber compounder is offered a choice of refined coal-tar plasticizers with different viscosities, distillation ranges and carbon disulfide insoluble contents. Serving both as softeners and extenders, the value of these products is indicated by their use throughout the rubber industry for mechanicals, footwear and reclaiming.

THE BARRETT DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N.Y.

The Barrett Company, Ltd.

5551 St. Hubert St., Montreal, Que.

Barrett

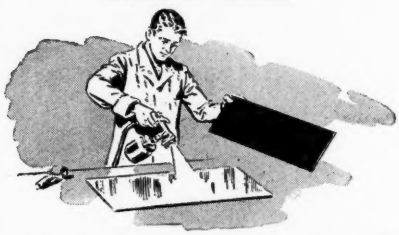
*Reg. U.S. Pat. Off.

ONE OF AMERICA'S GREAT BASIC BUSINESSES

For better cements, use

CHEMIGUM N-1

The Ideal Synthetic Rubber Base



ADHESIVES made with this Goodyear-developed, oil-resistant, *heat-softening* synthetic rubber base offer the following important advantages to rubber manufacturers:

HIGH DEGREE OF ADHESION to many types of surfaces.

HIGH FILM STRENGTH—high initial wet strength.

COMPATIBILITY—with large variety of plasticizing and reinforcing materials.

COMPLETE SOLUBILITY—in ketones and esters and chlorinated solvents, with high solids and low viscosity.

EASE OF APPLICATION—can be modified to produce adhesive with good brushing or spraying qualities.

LONGER TACK PERIOD—may be reactivated before laying up, if necessary.

HEAT-SOFTENING—reduces milling time—saves valuable labor.

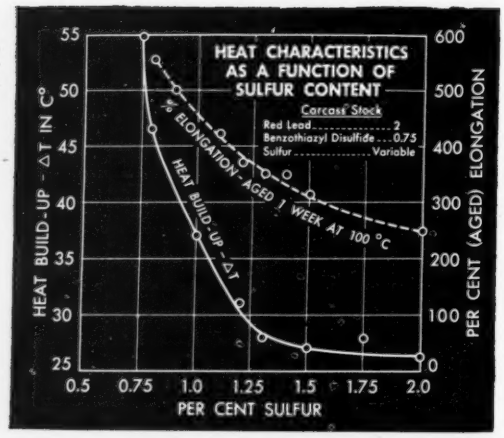
Goodyear's large production of **CHEMIGUM N-1** now assures users of an adequate and dependable source of supply, with uniformity carefully controlled. For complete information, write: Goodyear, Plastics and Chemicals Division, Akron 16, Ohio.

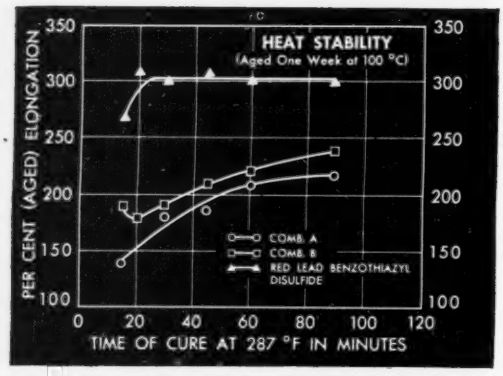
Chemigum—(pronounced Kem-e-gum)
T. M. The Goodyear Tire & Rubber Co.

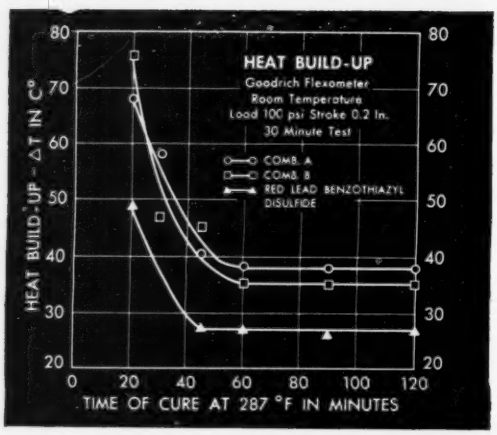
A PRODUCT OF GOODYEAR RESEARCH

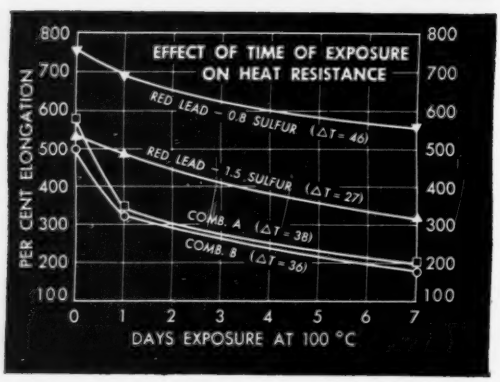
GOODYEAR

THE GREATEST NAME IN RUBBER


HEAT CHARACTERISTICS AS A FUNCTION OF SULFUR CONTENT
Carcass Stock
Red Lead 2
Benzothiazyl Disulfide ... 0.75
Sulfur ..... Variable
% ELONGATION AGED 1 WEEK AT 100 °C
HEAT BUILD-UP - ΔT
HEAT BUILD-UP - ΔT IN C°
PER CENT (AGED) ELONGATION
PER CENT SULFUR


HEAT STABILITY
(Aged One Week at 100 °C)
COMB. A
COMB. B
RED LEAD BENZOTHIAZYL DISULFIDE
PER CENT (AGED) ELONGATION
TIME OF CURE AT 287 °F IN MINUTES




EFFECT OF TIME OF EXPOSURE ON HEAT RESISTANCE
RED LEAD - 0.8 SULFUR (ΔT = 46)
RED LEAD - 1.5 SULFUR (ΔT = 27)
COMB. A (ΔT = 38)
COMB. B (ΔT = 36)
PER CENT ELONGATION
DAYS EXPOSURE AT 100 °C

Heat build-up and heat stability . . . both improve when you compound GR-S with RED LEAD

Have you had difficulty making your GR-S carcass stocks both heat resistant and cool running?

If so, try the right combination of red lead, benzothiazyl disulfide and sulfur.

Its acceleration is sufficiently active and efficient to provide—concurrently—heat stability and low heat build-up.

Note the following table and the accompanying charts.

FORMULA

GR-S (Institute)	100
S.R.F. Black	30
Zinc Oxide	3.0
Paraflux	7.5
No. 2 R.M. Red Lead	2.0
Benzothiazyl Disulfide	0.75
Sulfur	1.5

Physical Properties

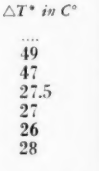
T/287° F.	Tensile Strength	% Elong.	T-300	Shore	ΔT° in C°
15	1520	860	315	....	....
20	1630	780	390	46	49
30	1450	630	520	47	47
45	1330	530	570	47	27.5
60	1210	480	520	47	27
90	1130	500	590	47	26
120	1100	500	610	47	28

	Aged One Week at 100° C.			Aged 48 Hours at 100° C.	
T/287° F.	Tensile Strength	% Elong.	T-300	Shore	ΔT° in C°
15	910	270	.....	....	....
20	1080	320	1000	54	30.5
30	990	300	990	54	30.5
45	1050	310	1000	53	29.5
60	1130	300	1090	53	26
90	1090	300	1090	53	25
120	1160	340	1100	53	25

** Goodrich Flexometer operated at room temperature. 30 minute tests. Load 100 psi, stroke 20%.*

SUMMARY OF ADVANTAGES

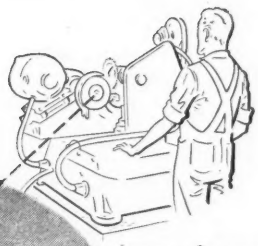
1. Imparts improved heat resistance—retention of elasticity.
2. Imparts improved heat build-up—cooler running.
3. Relatively faster curing rate.
4. Safe processing.
5. Excellent general physical properties.
6. Broad curing plateau—very little change in properties on overcures.
7. Economical.
8. Available.



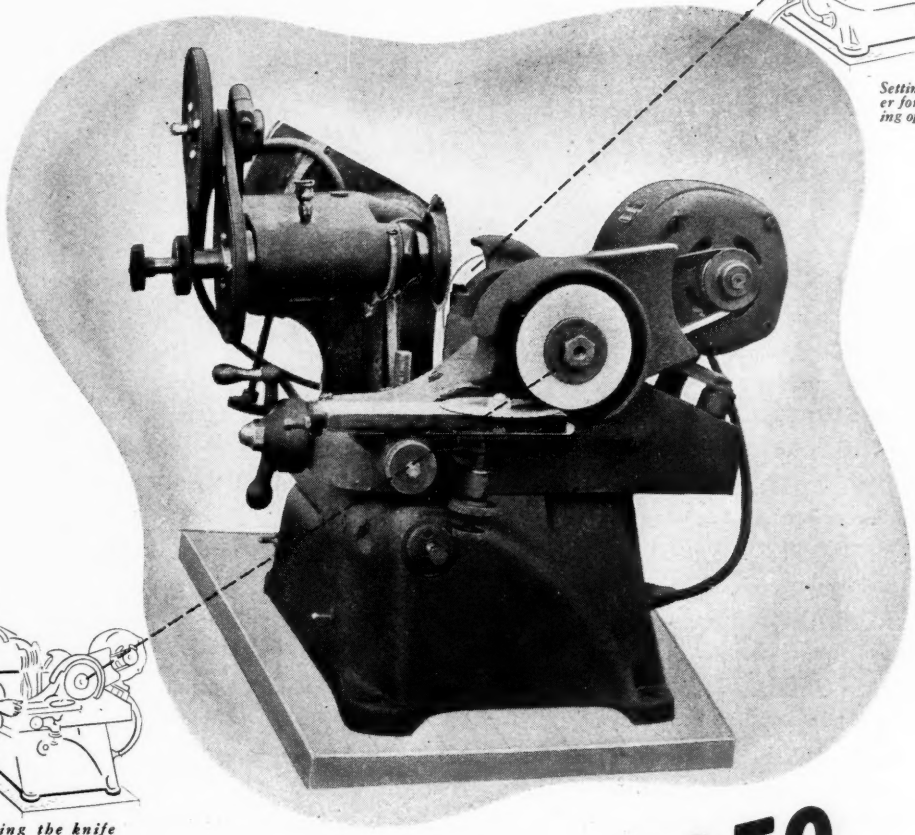
The charts illustrated are taken from a report on recent experimental work by the Rubber Division of our Research Laboratories on the problem of heat build-up and heat stability in GR-S stocks. Write for your copy. The report is titled, "The Heat Problem in GR-S Carcass Stocks."

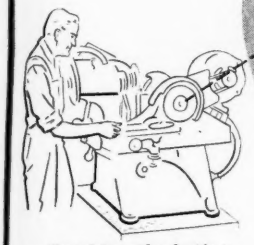
NATIONAL LEAD COMPANY New York, Buffalo, Chicago, Cincinnati, Cleveland, St. Louis, San Francisco; Boston (National-Boston Lead Co.); Pittsburgh (National Lead & Oil Co. of Penna.); Philadelphia (John T. Lewis & Bros. Co.).

Regrind your own bias cutter knives



Setting the Knife Grinder for the hollow-grinding operation.





Notching the knife while the second knife is hollow-ground semi-automatically.

$450

KNIVES last longer—cut better—when *precision ground* on a National Knife Grinder. Operator requires no special skill, and while one knife is being hollow-ground semi-automatically, another is being notched and sharpened.

Installation is as simple as an electric fan. Both grinding units—one for hollow-grinding, the other for sharpening and notching, are mounted on *one base* which can be plugged in anywhere required electrical current is available. The unit is powered by two small universal motors, which operate on 115 volt AC or DC or in special cases 220 or 440 volts. Simplicity of design keeps maintenance at a minimum.

Unit requires a space only 2½ ft. square by 18 inches high . . . is usually mounted on table height bench. Grinding wheels are 4″ in diameter, 3/16″ thick for hollow-grinding, and 3/64″ thick for notching. The National Bias Cutter Knife Grinder is priced at $450.00 f.o.b. Columbiana, Ohio. Please specify electrical characteristics when ordering. Write National Rubber Machinery Company, Akron 11, Ohio.

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★ **ADVAN**——New delayed action accelerator recommended for GR-S for footwear, hose covers, CV insulation, etc.

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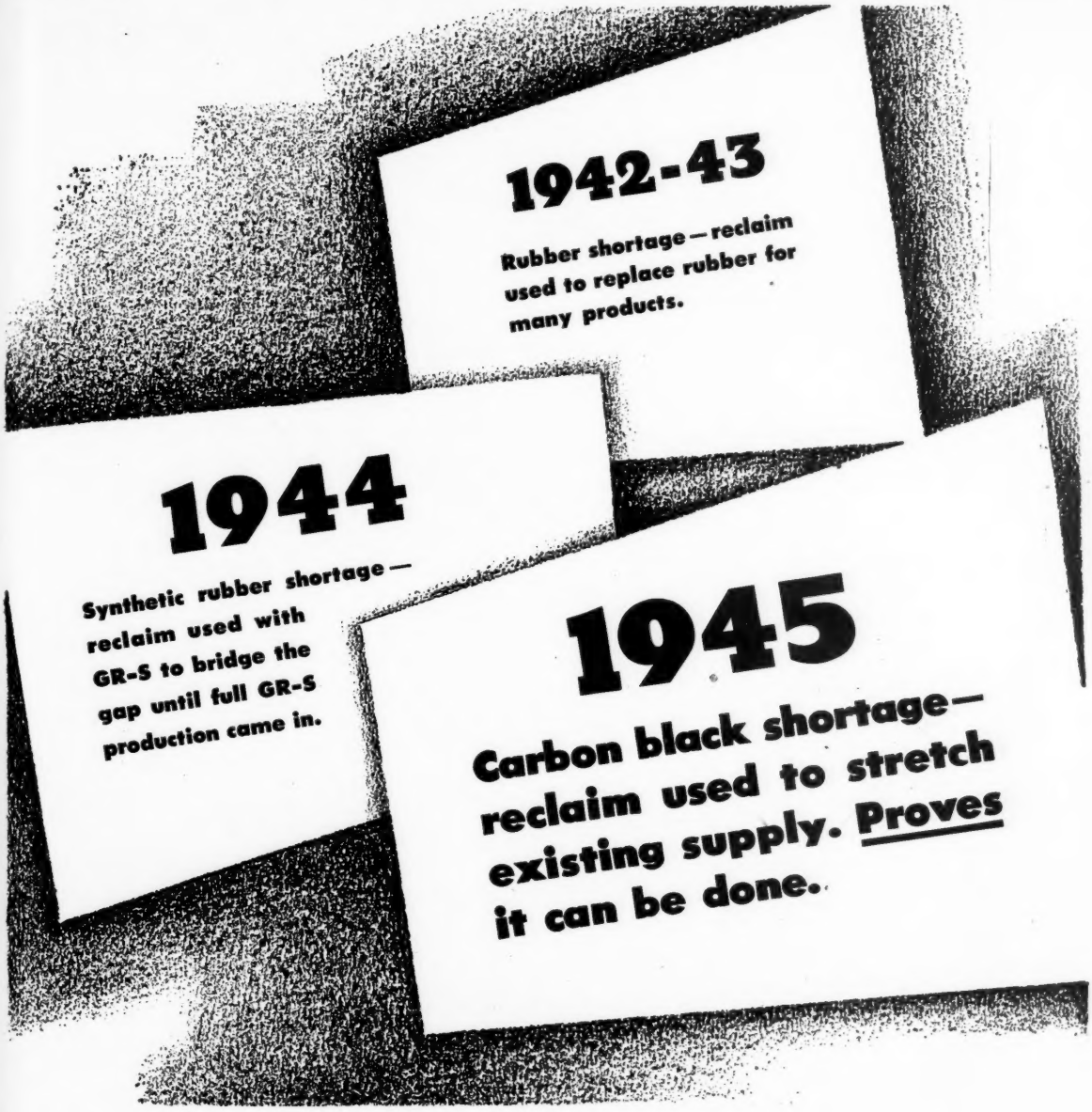
1942-43
Rubber shortage—reclaim used to replace rubber for many products.
1944
Synthetic rubber shortage—reclaim used with GR-S to bridge the gap until full GR-S production came in.
1945
Carbon black shortage—reclaim used to stretch existing supply. Proves it can be done.

THAT'S the wartime record—so far—of reclaimed rubber—a record that no other rubber-like material could equal. It's a demonstration of the versatility demanded of reclaimed rubber and the reclaimed rubber industry.

And nowhere in this important industry is there a company better qualified than Philadelphia Rubber to make sure that this material performs every job which it is called upon to do.

Take GR-S, for example. Philadelphia Rubber's accelerated research with GR-S established new and important facts about the compounding of GR-S and reclaim. Philadelphia Rubber research determined the compatibility of reclaim and GR-S, and went on to uncover ways of making better compounds at lower costs. This is research of the most practical kind because it will help now in winning the war.

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We salute a customer who tells his story of successful production of insulated wire and cable. (As it appeared in Marine Engineering and Shipping Review, June 1944.)

For 54 years Okonite, one of the pioneers of the industry, has been using John Robertson Lead Encasing Equipment — quality machinery means quality products.

1844 - One Hundred Years of Telegraphy - 1944

from the needs of telegraphy Okonite wire and cable research was born

JOHN HAVEN CHEEVER, pioneer rubber manufacturer, was started on the great research job that ended in his founding The Okonite Company when his friend Samuel F. B. Morse suggested the need for a rubber insulation that would protect telegraph wires in damp places.

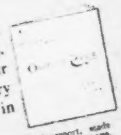
Cheever succeeded and Okonite's first major work was in supplying covered telegraph wire that helped our fast expanding nation get its messages through, despite trying conditions of heat and moisture.

So it has been for 66 years. As insulated wires and cables were needed for new developments, Okonite research supplied them; frequently our investigations have indicated far reaching possibilities in cable insulations and cable construction which have found valuable applications. In a number of instances we have developed new synthetic compounds which time has proved are superior in many respects to those made from natural materials.

Okonite research is not an abstract, theoretical venture. It's a down to earth, practical branch of our business. Its results are of benefit to — and available to — all our customers. It's both general, in a broad sense, and very specific in its search for perfection and discovery in individual fields.

For a discussion of Okonite wire and cable research, with concrete examples, write for Bulletin OK-1005A, a well illustrated 36 page booklet.

The Okonite Company, Passaic, New Jersey.



A report, made over 50 years ago, on Okonite Cables by English scientists who found Okonite Tensile "excellent."

THE DERIVATION OF OKONITE

OK — A signal flashed by telegraphers indicating message got through.

O — To aid in pronunciation.

NITE — A suffix used in the early days (as in "indemnite") to signify "insulation"

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Insulated Wires and Cables

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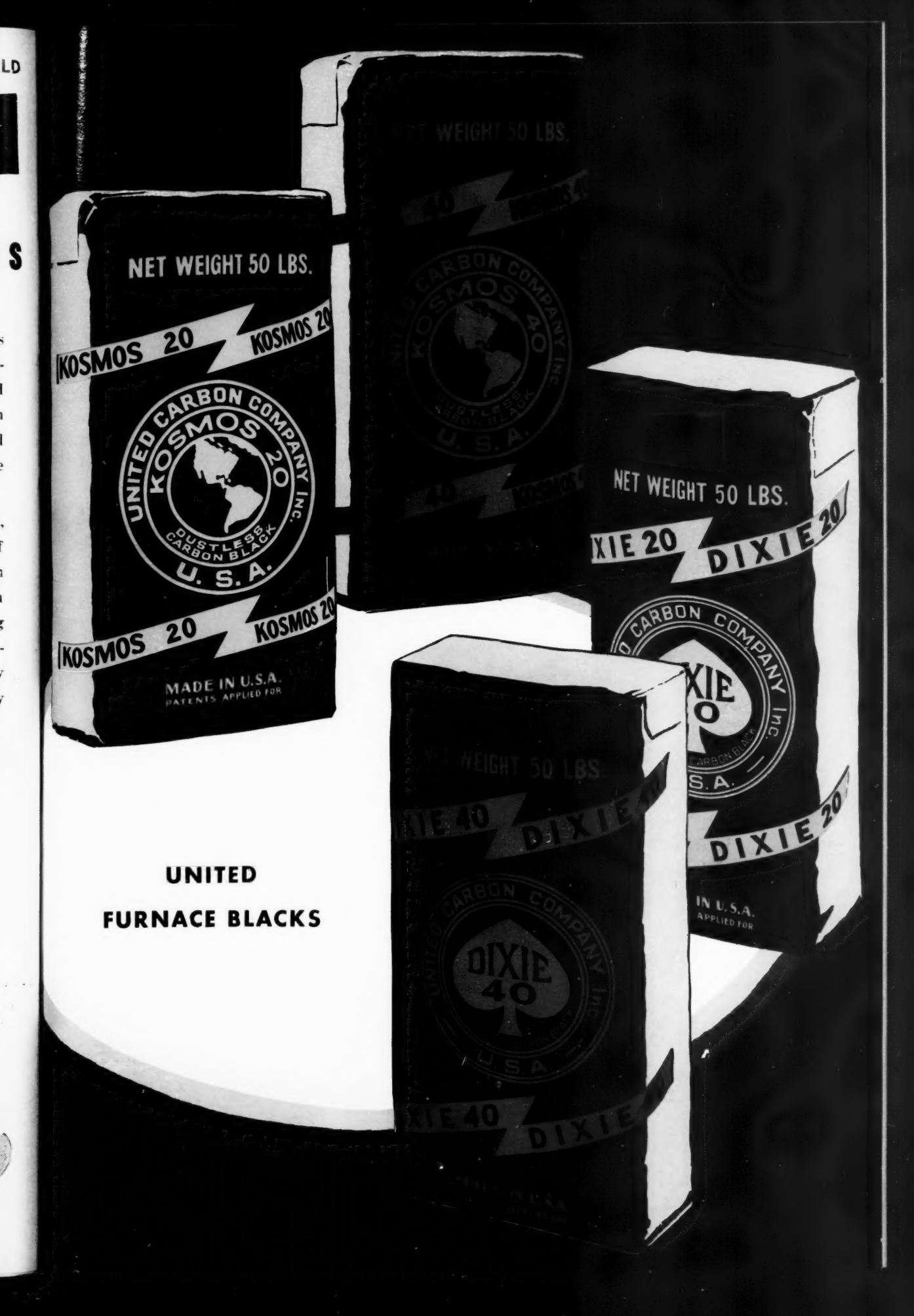
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United Furnace Blacks of the semi-reinforcing (SRF) type. They are ideal for GR-S and other rubbers used in military and civilian goods. Their outstanding features are ease of processing—good plasticity—fast rate of cure—high resiliency and low heat build up. We recommend them for blending with channel black for moderate reinforcement and low heat build up.

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DIXIE 40 • KOSMOS 40

United Furnace Blacks of the reinforcing (HMF) type for synthetic and natural rubber. They possess a combination of most desirable characteristics, including cool mixing—easy processing—smooth and rapid extrusion—fast rate of cure—full reinforcement—low heat build up and high resiliency. They also possess high resistance to cut growth—flex cracking and abrasion. They are especially useful for tires of all types, pneumatic or solid, under any conditions; tubes; bogie wheels; footwear; and mechanical goods.

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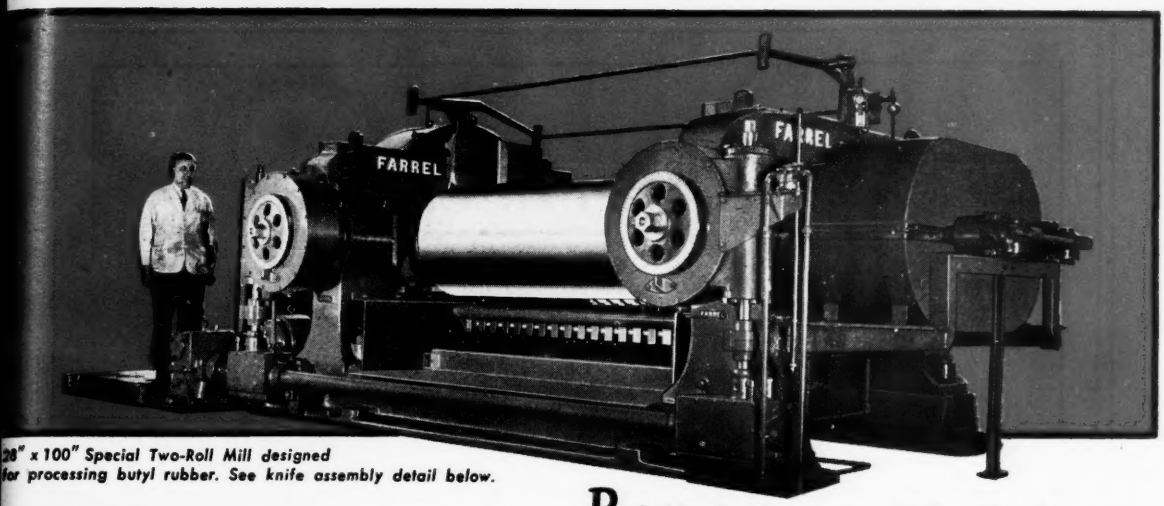
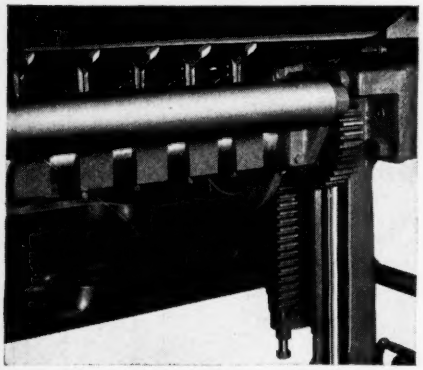


28" x 100" Special Two-Roll Mill designed for processing butyl rubber. See knife assembly detail below.

MILLS FOR MANY USES



Detailed view of mechanism for raising and lowering the knife assembly. Stock pan was removed for this photo.

F-B PRODUCTION UNITS

Banbury Mixers — Plasticators — Pelletizers — Mixing, Grinding, Warming and Sheeting Mills — Bale Cutters — Tubing Machines — Refiners — Crackers — Washers — Calenders — Hose Machines — Hydraulic Presses — and other equipment for processing rubber and plastic materials.

Probably the largest ever built, either here or abroad, this huge 28″ x 100″ two-roll mill is designed for two distinct operations in the processing of butyl rubber.

During the hot working part of the process a specially designed pan catches all particles falling from the rolls. When this operation has been completed, an air controlled mechanism folds back the pan and raises a series of calender-type knives into position. The knife assembly is designed so that practically any width and number of strips can be removed from the mill after the hot working operation has been completed. Scrapers can be substituted for the knives when required.

This is only one example of a Farrel-Birmingham mill *designed for the job.* There are many others, in a wide range of sizes, for mixing, grinding, warming and sheeting natural and synthetic rubber, processing of cellulose compounds, pyroxylin plastics, synthetic resins, caseins, shellac compounds, bakelite, celluloid, explosives, abrasives, linoleum, phonograph record stock, and other purposes.

When you need a mill we suggest you ask our engineers for recommendations and get the benefit of their experience.

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One principle governs the production of St. Joe lead-free Zinc Oxides; it has always done so; it is, above all else, to make as nearly perfect a product as is humanly possible. The maintenance of that principle places responsibilities upon all in this organization—it inspires every operation of hand and machine. This insistence upon perfection is not the easiest way; it is, rather, the natural result of a policy established by the management of this company before the first ton of Zinc Oxide was produced. This policy has made the St. Joseph Lead Company's products famous for their consistent high quality among consumers of lead-free zinc oxides.

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RESEARCH men of rubber and plastics have a responsibility — the responsibility of creating out of the developments of chemistry remarkable new products and materials for present and post-war uses. PICCOLASTIC —the new series of styrene resins offers a challenge to the genius of these men. Because of its wide assortment of melting points, molecular weights and solvencies, it is extraordinarily versatile in its applications. In fabric and paper coatings and laminations, insulation, pressure sensitive and heat-sealing adhesives, moldings, impregnants and in plasticizing ability, PICCOLASTIC opens astounding opportunities in industrial fields hitherto undreamed. Complete data and samples on request.

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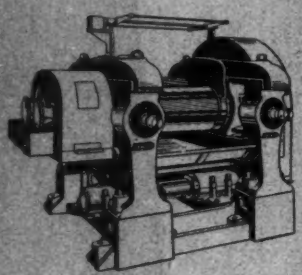
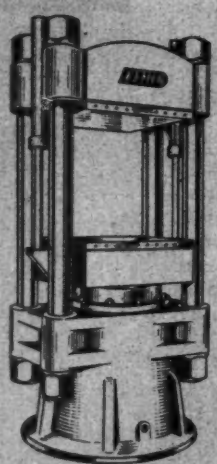


EEMCO CRACKER



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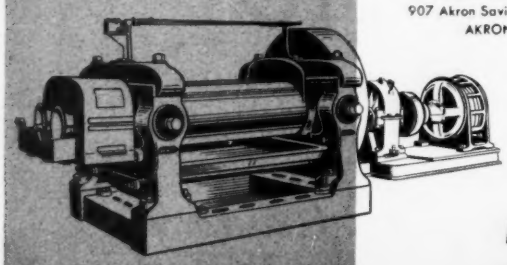

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Outstanding features of the line of Rubber and Plastics Processing Machinery manufactured by EEMCO are (1) correct design (2) sturdy and dependable (3) built for heavy duty and long life with minimum repair. All EEMCO Rubber and Plastics Processing Machinery is built in smaller sizes for laboratory use. Mills, Crackers, Refiners and Washers are furnished as single units or for operation "in line" of two or more. Floor level drives are provided when wanted. Write EEMCO for your Rubber or Plastics Processing Machinery needs—early deliveries are now being made. Bulletins on desired machines will be sent, on request.

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4. TIME

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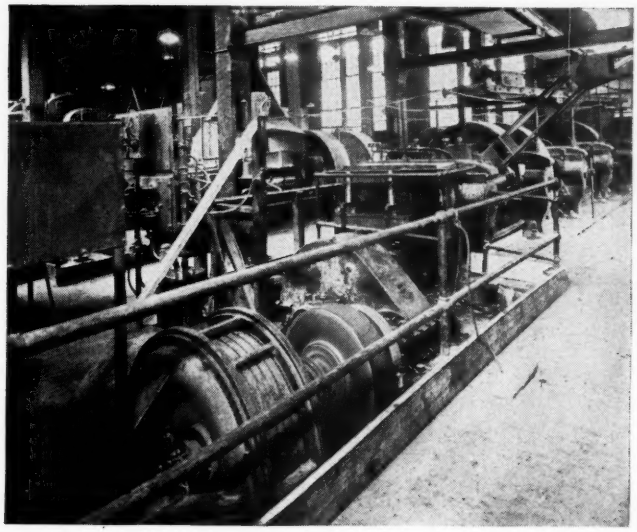

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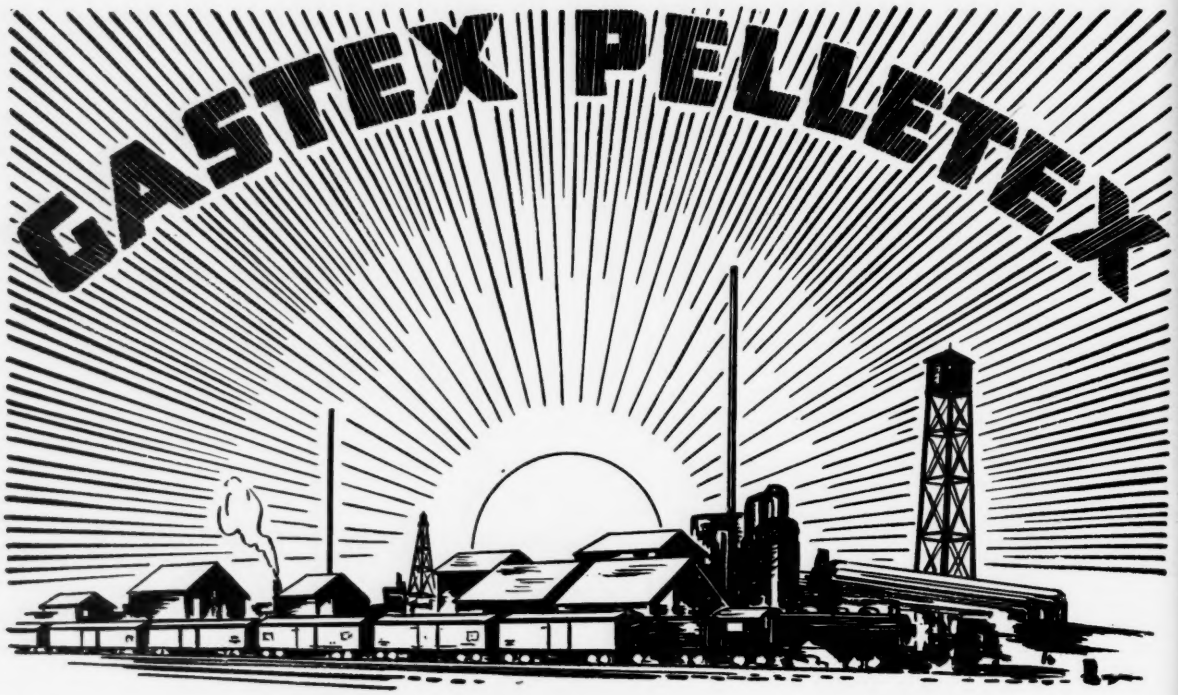

Bringing Up Reinforcements

With the April completion of additional production units at our Pampa plant, we are happy to announce an increased production of 20,000,000 pounds of PELLETEX annually. This new capacity will help relieve present pressure on our facilities for critical government allocations, and enable us to better serve our customers, both old and new, when the new day dawns after Victory.

PELLETEX

Semi-Reinforcing Furnace

BLACK

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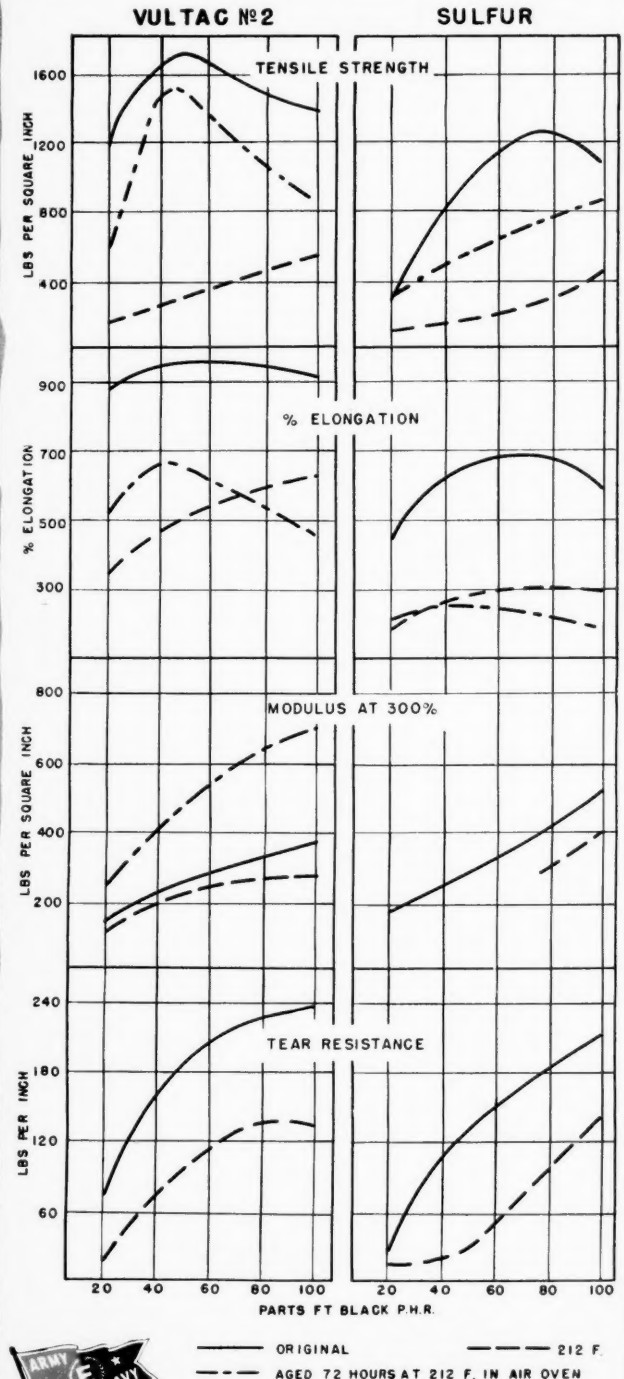
April,

VULTAC ... DEVELOPS THE LATENT REINFORCING PROPERTIES OF FT CARBON BLACK IN GR-S



In the compounding of natural rubber, Fine Thermal Black occupies a unique position as a reinforcing pigment. Its use in this polymer yields stocks possessing increased tensile strength, modulus and resistance to tear, at the same time retaining excellent elongation, resiliency and snappy cure. By virtue of this combination of properties, it was used extensively in the compounding of heavy duty inner tubes. Unfortunately, Fine Thermal Black has not given results in the compounding of GR-S commensurate with its performance in natural rubber, and is generally used in GR-S only in combination with other carbon blacks. It has now been found, however, that this black may be adapted successfully to the compounding of GR-S as a primary reinforcing agent through the use of VULTAC, a new type of organic vulcanizing agent.

PROPERTIES:

VULTAC NO. 2 is an alkyl phenol disulfide containing 23% sulfur. It is a hard brown resin having a specific gravity at 25/25° C. of 1.16–1.17 and a softening point of 55–65° C. It disperses readily in GR-S under normal milling conditions and functions as a processing aid to give pliant, smooth-milling stocks, possessing excellent building tack. This latter property is particularly outstanding in the case of GR-S stocks loaded with FT Black.

VULTAC NO. 2 improves the dispersion of FT Black in GR-S. Unlike pigment sulfur which possesses limited solubility in GR-S, Vultac No. 2 is readily soluble in this copolymer. During cure, active sulfur is released to give uniformly vulcanized products. The cumulative effect of improved pigment dispersion and uniform vulcanization is to bring out the full latent reinforcing power of FT Black in GR-S. The superior properties which may be achieved by the adaptation of this new vulcanizing agent to GR-S—FT Blacks formulations are illustrated in the accompanying charts.

FORMULATIONS:

The compounding results upon which the graphs were plotted were taken in the Sharples Rubber Laboratory using the following base formula and curing conditions:

GR-S		100
Bardol		5
Zinc Oxide		5
FT Carbon Black		Varied
Captax		1.6
DPG		0.1
Vulcanizing Agent		
Vultac No. 2	7.0	—
Sulfur	—	1.6

Optimum cures at 280° F. selected from "Modulus—time of cure" curves.

ADVANTAGES:

The data presented indicate the following advantages are inherent in the use of Vultac No. 2 in conjunction with FT Black in GR-S:

1. Tensile strength, elongation and resistance to tear are increased greatly over a wide range of loadings.
2. The retention of all physical properties upon severe heat aging is markedly improved.
3. The tendency toward "marching modulus" upon aging is minimized.
4. The maximum reinforcement is effected with lower pigment loading—50 parts of black with Vultac No. 2 as compared with 75 parts for sulfur-vulcanized stock.

In addition to the properties shown by graph, the flex-cracking resistance of GR-S—FT black stocks cured with Vultac No. 2 is outstandingly superior to that of the corresponding sulfur vulcanizates.

AVAILABILITY:

VULTAC is also supplied in two other forms to meet the varying requirements of the rubber industry: Vultac No. 1 containing 13% and Vultac No. 3, 28% sulfur. All three are now available in commercial quantities against orders specifying a "synthetic rubber" end use.

For additional data and suggestions for the use of Vultacs, write for your copy of the Sharples Booklet 44-1, entitled "VULTAC." Samples of these interesting new vulcanizing agents will be sent upon receipt of your request.

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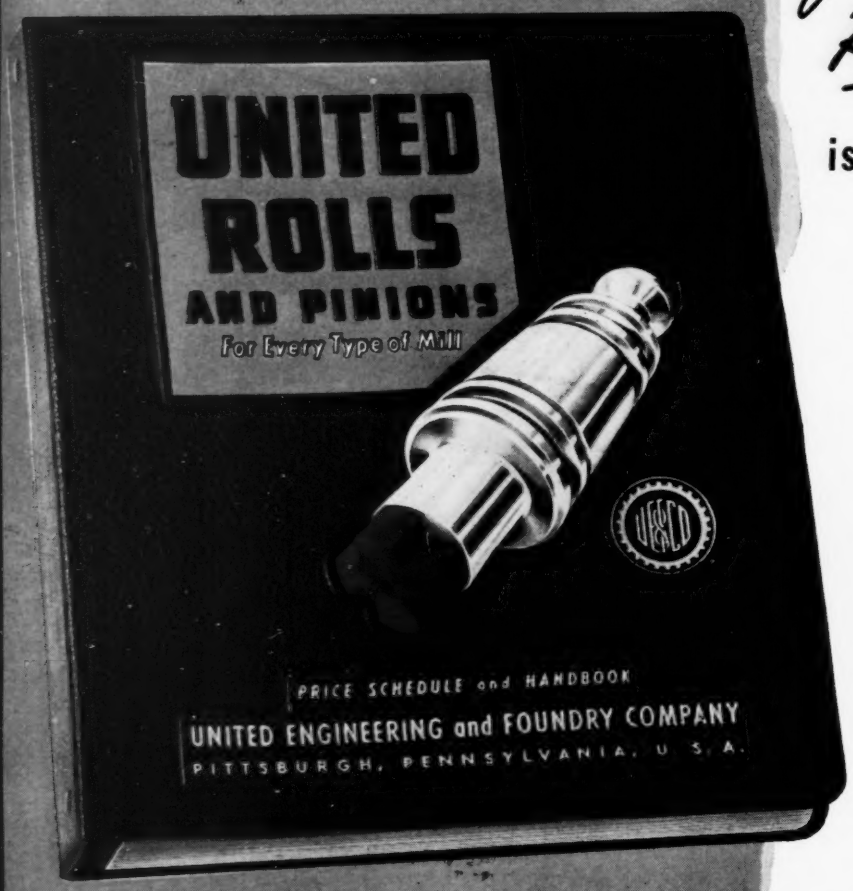

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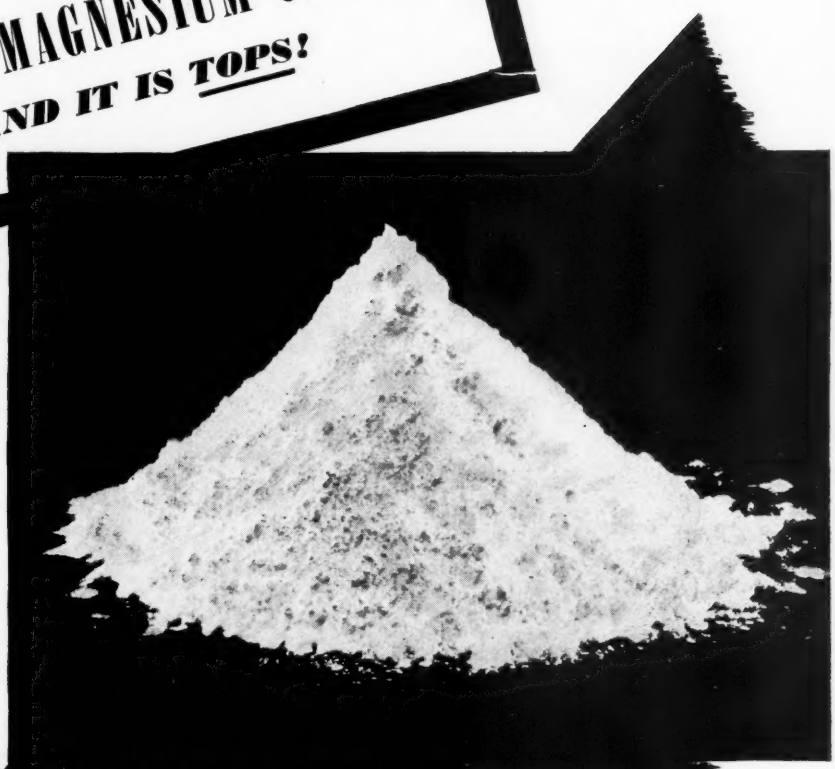

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In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wis.

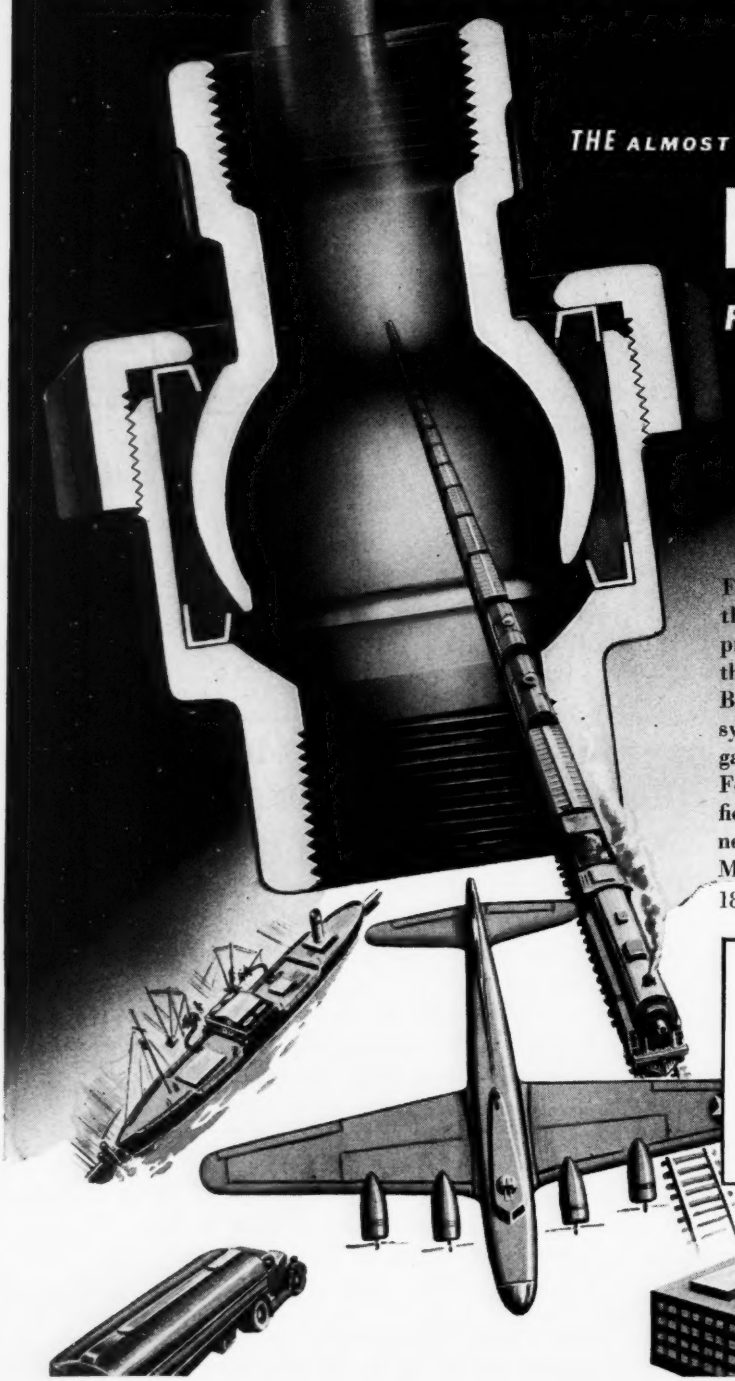
In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

FOR THE ARTERIES OF PRODUCTION

THE ALMOST INDISPENSABLE

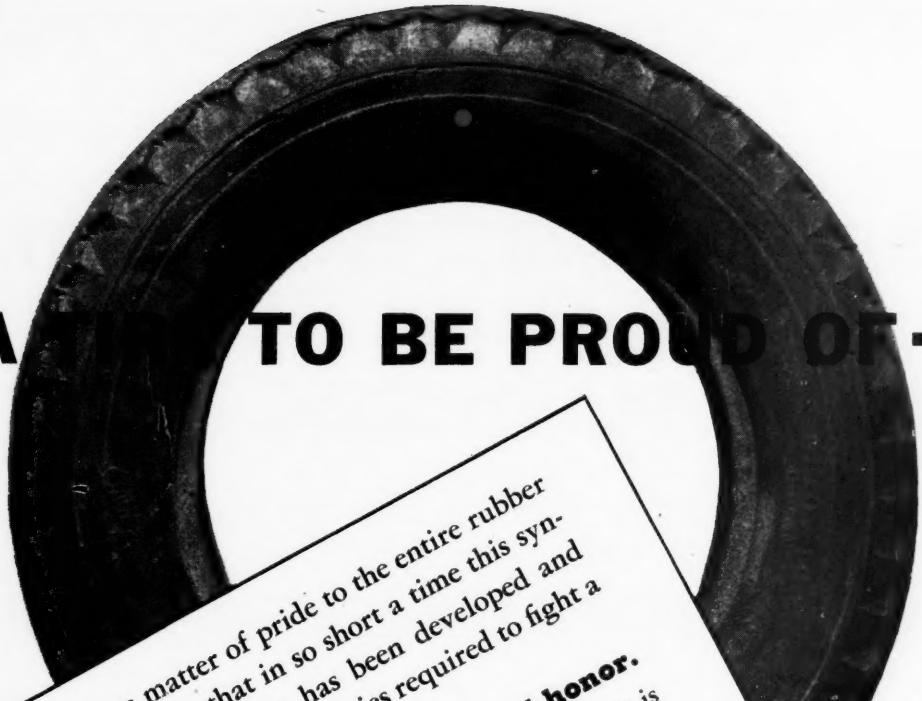
BARCO

FLEXIBLE JOINTS



Fluids—oil, gasoline, water, steam—are the very life-blood of America's vast production program. And everywhere throughout industry and transportation, Barco Flexible Joints protect the arterial system which conveys these liquids and gases against vibration, impact and shock. For over 30 years, Barco has led in its field... developing flexible joints for every need. Write for catalogue to the Barco Manufacturing Company, Not Inc., 1810 Winnemac Avenue, Chicago, 40, Ill.

Not just a swivel joint... but a combination of a swivel and ball joint with rotary motion and responsive movement through every angle.



A [illegible] TO BE PROUD OF—

IT is a matter of pride to the entire rubber industry that in so short a time this synthetic rubber tire has been developed and supplied in the quantities required to fight a global war.

The RED DOT is a badge of honor.

The RED DOT on this tire indicates that it is made from synthetic rubber.

This same RED DOT is a protection for the user of reclaimed rubber. By means of it reclaimers are able to separate natural rubber tires from synthetic rubber tires when they eventually reach the scrap pile.

Both materials make good reclaims, provided they are handled separately, by the particular process each requires.

The RED DOT is your protection and ours, as well as a mark of achievement.

PEQUANOC RUBBER CO.

QUALITY RECLAIMS FOR SPECIFIC PURPOSES

BUTLER — Factory and Main Office — NEW JERSEY

SALES REPRESENTATIVES

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162 Park Square Bldg.,
Back Bay, Boston, Mass.

Burnett & Co. (London) Ltd.
46 Herga Court
Harrow-on-Hill, Middlesex, England

HARDESTY DIBUTYL SEBACATE

means

HIGHEST PLASTICIZING POWER

The main purpose of a plasticizer is to impart flexibility to plastic materials and elastomers. In this property, Hardesty Chemical Dibutyl Sebacate is one of the most efficient plasticizers known. This is strikingly shown in the following table giving the properties of test strips of Vinylite VYNW containing three different plasticizers. The basic formulation used in making these strips consisted of 100 parts of Vinylite VYNW, 55 parts of plasticizer, 2 parts of calcium stearate, and 0.75 part of stearic acid. This mixture was milled on a two-roll mill with roll temperature of 300-310°F., and then molded for ten minutes at 300°F. and chilled under pressure.

These properties show the outstanding plasticizing power of Hardesty Chemical Dibutyl Sebacate. This plasticizing power is retained at extremely low temperatures, as shown by the cold cracking tests in the table below.

Hardesty Chemical Company Dibutyl Sebacate is used as a plasticizer for the vinyl copolymers, polyvinyl chloride, polyvinyl butyral, nitrocellulose, cellulose acetobutyrate, acrylic resins and synthetic rubbers.

In addition to its high plasticizing power and low temperature flexibility, Dibutyl Sebacate is also characterized by its high solvency for various elastomers. It is extremely resistant to yellowing on long exposure to light, tasteless and has no residual odor.

A letter to Hardesty Chemical Company will bring a sample and further information by return mail.

Plasticizer	Modulus at 100% Elongation	Tensile at Break	Elongation	Set	Shore Hardness	Cold Cracking Temperature
Dibutyl Sebacate	584 p.s.i.	2220 p.s.i.	405%	50%	62	Below — 80°F.
Dioctyl Phthalate	1075 p.s.i.	2795 p.s.i.	365%	39%	79	—45°F.
Tricresyl Phosphate	1780 p.s.i.	3150 p.s.i.	285%	27%	85	0°F.

Properties of Dibutyl Sebacate

Purity	98.5% Minimum
Specific Gravity	0.935 20/20°C.
Acidity as Sebacic	0.3% Maximum
Ash	0.001% Maximum
Iron	0.3 ppm Maximum
Butanol	0.1% Maximum
Flash Point	380°F.
Boiling Point	344°C. 760 mm. 175-180°C. @ 3 mm.
Water Solubility	Less than 1% @ 25°C.
Freezing Point	11°F.
Dielectric Constant	3.6
Power factor—60 cycles	6

HARCHEM

PLASTICIZERS

Alkyl Roleates

Dibutyl Sebacate

Capryl Alcohol

HARDESTY CHEMICAL COMPANY, INC., 41 EAST FORTY-SECOND STREET, NEW YORK 17, N.Y.

FUZON-O

The New Waterproof Coating with "VINYLITE" Resin base

CUTS TIME, LABOR & MATERIALS, IN HALF

FUZON-O, the amazing new "Vinylite" resin base formulation which cuts cost three ways, resists oil, grease, alkali and acid . . . withstands the oxidizing effects of air and the photochemical effect of sunlight . . . is exceptionally immune to moisture, abrasion and temperature variations. Use FUZON-O on cotton, nylon and glass fabrics . . . and many other materials. For complete information about FUZON-O address the Stanley Chemical Company . . . manufacturers of Stanley Lacquers, Enamels, Synthetics and Japans . . . East Berlin, Connecticut.

*Trade Mark Carbide and Carbon Chemicals Corporation

Stanley Chemical

LABORATORY TESTED PRODUCTS FOR THE

RUBBER Industry

When you specify "Whittaker" products, you can be sure of uniformity and quality. Strict testing is done in our own laboratory.

Talc • Stearates • Heavy Magnesium Oxide • Extra Light Calcined Magnesia • Pumice Stone • Whiting Sericite • Magnesia Carbonate • Pyrophyllite

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260 West Broadway, New York City • Plant: South Kearney, New Jersey

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CLEVELAND — Palmer Supplies Co., formerly Palmer Schuster Co.

Announcing a change in name (and in name only)

SCOTT TESTERS, INC.

formerly Henry L. Scott Co.

This new name is adopted as more descriptive of the nature of our business, which since 1899 has been the manufacture of physical testing apparatus that has become literally "Standard of the World."

SCOTT TESTERS, INC., PROVIDENCE, R. I.

SYNTHETIC RUBBER LATICES
COMPOUNDED AND UNCOMPOUNDED
Naugatuck Chemical
DIVISION OF UNITED STATES RUBBER COMPANY
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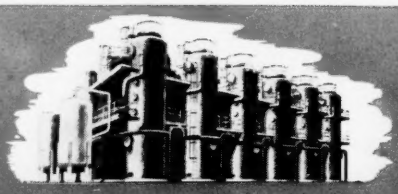


UNION CARBIDE *AGAIN* REPORTS

on the production of

BUTADIENE

for the Government's Synthetic Rubber Program

ONE OF THE MOST IMPORTANT factors in the Government's rubber program is the production of GR-S type synthetic rubber. The basic chemical in this rubber is Butadiene, which can be made from alcohol or hydrocarbon materials.

The Government's original plan provided that about one third of the required Butadiene would be made by CARBIDE AND CARBON CHEMICALS CORPORATION'S alcohol process.

In 1943, their first year of operation, however, the plants using this process produced over 75 per cent of all Butadiene made for GR-S type synthetic rubber.

In 1944, the second year, these plants produced about 64 per cent of all Butadiene necessary for military and essential civilian rubber. This was true despite the fact that good progress had been made in the production of Butadiene by other processes.

THE RECORD

The first tank-car load of Butadiene was shipped from the Government's Carbide-built, Carbide-operated plant at Institute, West Virginia a little over two years ago.

This was just five months after the famous Baruch Committee Report pointed out this nation's desperate need for rubber—and approved Carbide's butadiene alcohol process, originally selected by Rubber Reserve Company, as one of the solutions.

In its first year the Institute plant, with a rated capacity of 30,000 tons per year, produced enough Butadiene for more than 90,000 long tons of synthetic rubber.

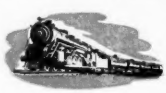
Two more great plants using Carbide's alcohol process—and built from the blueprints of the Institute plant—are in full production. One of these, with an annual rated capacity of 30,000 tons of Butadiene is located at Kobuta, Pennsylvania and is operated for the Government by another important chemical company.

The second, with a rated capacity of 60,000 tons a year, is operated for the Government by Carbide at Louisville, Kentucky—making the total rated capacity of the two huge plants now operated by Carbide 140,000 tons a year.

In 1944, the production of Butadiene from the three plants using the alcohol process totaled 361,000 tons—representing operation at over 164 per cent of rated capacity. An even higher rate is expected in 1945.

* * * * *

Before Pearl Harbor, the United States was a "have not" nation with respect to rubber. Now, thanks to American research, engineering and production skill, our country can take its place as a dominant factor among the great rubber producing nations of the world.



▼

Business men, technicians, teachers, and others are invited to send for the book RU-1 "Butadiene and Styrene for Buna S Synthetic Rubber from Grain Alcohol," which explains what these plants do, and what their place is in the Government's rubber program.

SEPTEMBER 10, 1942

"Of all the critical and strategic materials, rubber is the one which presents the greatest threat to the safety of our nation, and to the Allied Cause . . . We find the situation to be so dangerous that unless corrective measures are taken immediately the country will face both a military and a civilian collapse."

—Report of the Rubber Survey Committee (Baruch Committee).

AUGUST 31, 1944

"Undoubtedly the outstanding achievement of your company has been the development of your process for the production of Butadiene from alcohol. With a rather meager background of experimental work, your engineers were able to design and construct commercial units for the production of Butadiene. In an exceedingly short time, the operation of this equipment at capacities up to 200 per cent of rating has been largely responsible for our present safe situation with respect to rubber supplies . . ."

—Letter from Rubber Director Bradley Dewey to CARBIDE AND CARBON CHEMICALS CORPORATION

The material herein has been reviewed and passed by the Rubber Reserve Company, the Defense Plant Corporation, and the War Department.

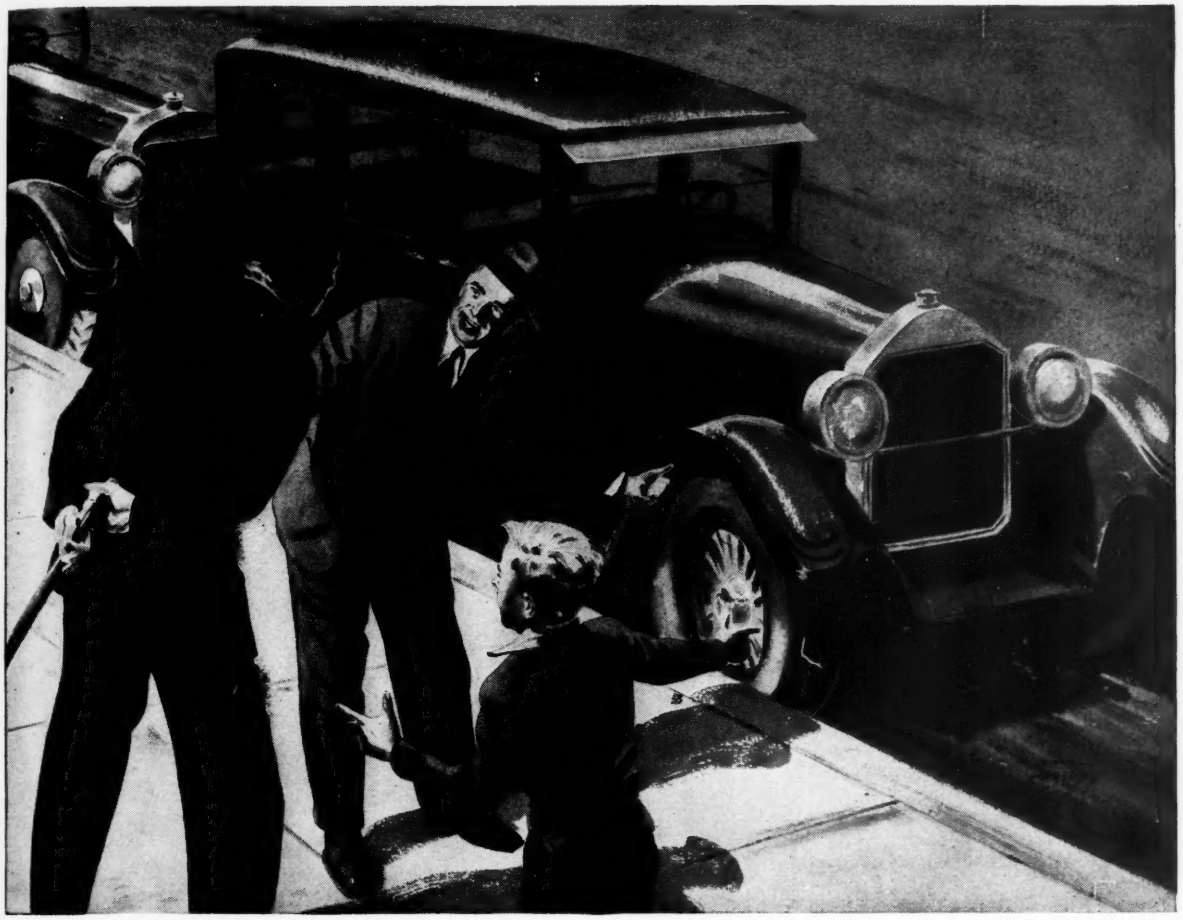
BUY UNITED STATES WAR BONDS AND STAMPS

UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street UCC New York 17, N. Y.

Principal Units in the United States and their Products

ALLOYS AND METALS—Electro Metallurgical Company, Haynes Stellite Company, Kemet Laboratories Company, Inc., United States Vanadium Corporation
CHEMICALS—Carbide and Carbon Chemicals Corporation **PLASTICS**—Bakelite Corporation **ELECTRODES, CARBONS & BATTERIES**—National Carbon Company, Inc.
INDUSTRIAL GASES AND CARBIDE—The Linde Air Products Company, The Oxweld Railroad Service Company, The Prest-O-Lite Company, Inc.



"Any road is a Smooth road"

"The new balloon tire gives smooth riding on the roughest roads... smothers all shocks... in fact, any road is a smooth road with balloon tires... it is almost impossible to choose phraseology to drive home the wonderful effect these tires have on riding." Thus wrote an enraptured newsman in the 'twenties when the balloon tire appeared on the scene and created a sensation in the automobile world. And such enthusiasm was fully justified, for this tire not only brought the motoring public new comfort and safety at higher speeds but even inspired radical improvements in the design of automobiles themselves!

Since that time, the balloon tire has been greatly improved. The increased resilience, wear and abrasion resistance that we have learned to expect in modern tires have been made possible in no small measure by Witco's continuing program of research in the development of better carbon blacks, fillers, accelerators, dispersing agents and other rubber compounding materials. Today, Witco products are helping to impart these same qualities to the huge airplane, truck and prime moving equipment tires made of synthetic rubber. Among recent Witco achievements is the production of a special type carbon black that minimizes the danger of overheating and premature failure in synthetic tires. Thus is product improvement through research increasingly important in the chemical service Witco renders not only to rubber, but to paint, ink, paper, plastics and other industries.

WITCO CHEMICAL COMPANY

MANUFACTURERS AND EXPORTERS

[Formerly Wishnick-Tumpeer, Inc.]

295 MADISON AVENUE, NEW YORK 17, N. Y.

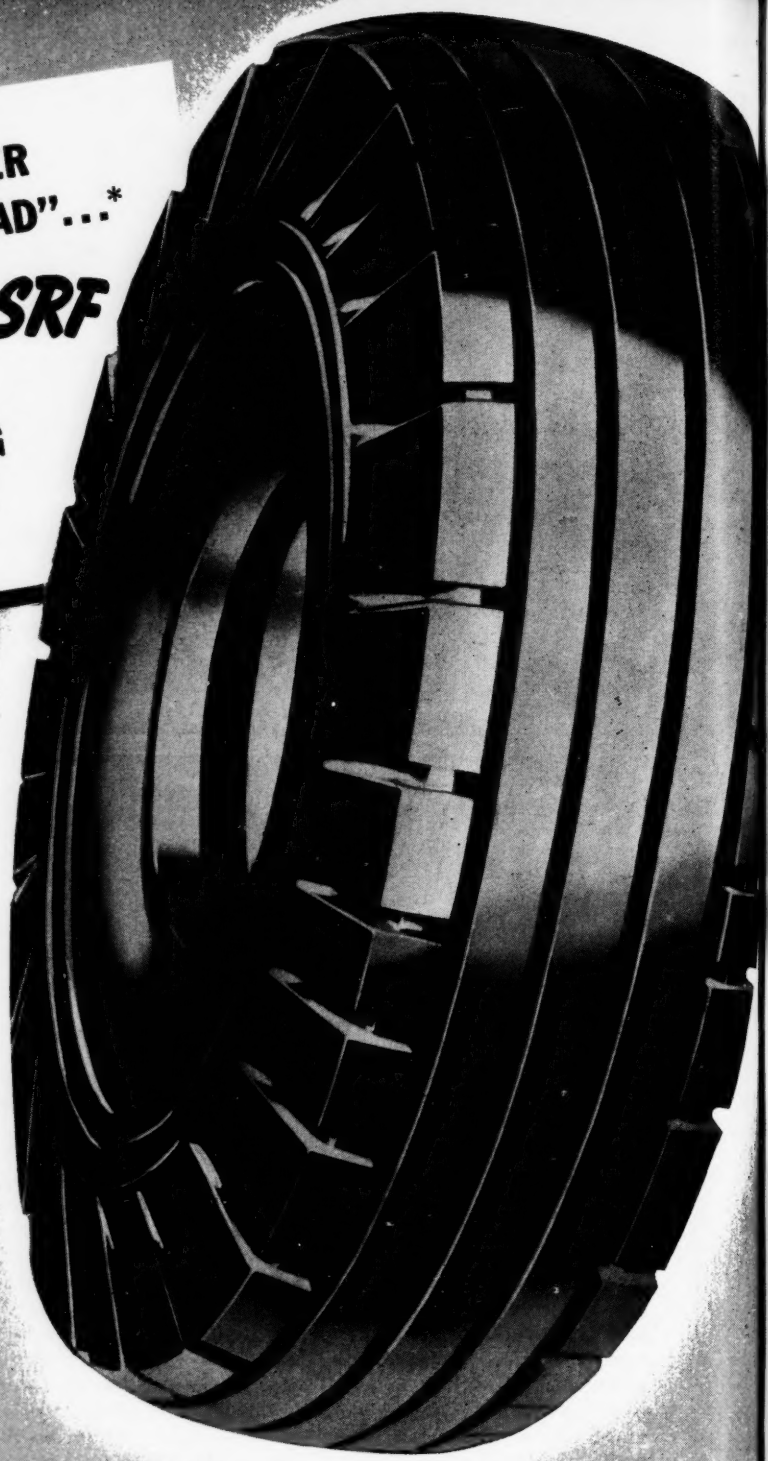
Boston • Chicago • Detroit • Cleveland • Akron • London

DELIVERS GREATER "STRENGTH AND LOAD"...*

Continex SRF

SEMI-REINFORCING FURNACE BLACK

*Greater strength and loading capacity.



Continex SRF is a specially developed semi-reinforcing furnace type black of greater strength and loading capacity. It improves and facilitates processing and imparts definite advantages to the finished rubber products in which it is used. Carefully "engineered" as to properties and characteristics and rigidly controlled in production, it delivers greater strength and loading capacity and assures higher rebound resilience and longer service life. More complete information is contained in our Continex SRF Technical Bulletin, which is yours for the asking. May we mail you a copy?

CONTINENTAL CARBON COMPANY

MANUFACTURER

[CONTINENTAL CHANNEL AND FURNACE BLACKS]

25th Anniversary WITCO

WITCO CHEMICAL COMPANY

DISTRIBUTOR

[FORMERLY WISHNICK-TUMPEER, INC.]

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2 New Compounds for...

PAPER

ARMY-NAVY ORDNANCE WRAP

To meet the rigorous specifications of the joint ARMY-NAVY procurement agency for greaseproof ordnance wrapping paper, General Latex has developed a synthetic latex-base adhesive for laminating cellulose acetate or cellophane to kraft paper.

The most critical features for this adhesive are:

1. *Neutral* (water-extract between 6.5 and 7.5 pH). Ordinary synthetic latex adhesives are alkaline and other commonly used compounds are acid.
2. *No delamination* after: 7 days at 140° F; 112 hours in Fadeometer; 8 days in oxygen bomb.
3. *Cost* per dry pound and on a mileage basis significantly lower than adhesives now in current use for this purpose.

Available either uncolored or dyed red for immediate application.

TEXTILES

QUARTERLINING AND LEATHER SUBSTITUTES

This new synthetic adhesive provides an effective undercoat for lacquer on rubber-impregnated textiles in ladies' shoes and other products requiring a high-grade leather substitute.

It minimizes discoloration of the lacquer and reduces migration of the lacquer plasticizer. Available as an aqueous dispersion ready for use.

A practical approach to the use of synthetic dispersions in your product is to refer your problem to our laboratory. No matter what the process — coating, impregnating, or bonding — our experienced technical staff specializes in compounding the material best suited to your requirements.

GRS latex types, 2, 3 and X-160, normal and concentrated, available from stock.

A Complete Service to Manufacturers

RESEARCH • MATERIALS • ENGINEERING • MANUFACTURE

General Latex & CHEMICAL CORP.

666 MAIN STREET, CAMBRIDGE, MASS.

Agents for Rubber Reserve Company for storage and distribution of natural rubber latex. Distributors for Rubber Reserve Company for synthetic latex. Operators of the Government-owned Baytown, Texas, synthetic rubber plant in collaboration with the General Tire & Rubber Co.

The smart white rubber commodities of pre-war days really have been missed. An eager market awaits their return.

And the extreme whiteness and brightness contributed to natural rubber products by titanium pigments are well worth the waiting. The effectiveness of these pigments, which are most widely known under the name of TITANOX, is unrivaled.

High tinting strength, fine particle size and reinforcing qualities are characteristics of TITANOX pigments which have earned them top rating in white rubber compounding.

TITANOX pigments will help you to meet exacting post-war standards of whiteness and brightness. For the present they make it possible for you to achieve the greatest obtainable whitening effect in GR-S.

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT
111 Broadway, New York 6, New York
104 South Michigan Ave., Chicago 3, Ill.
350 Townsend St., San Francisco 7, Cal.
2472 Enterprise St., Los Angeles 21, Cal.

TITANOX
REG. U. S. PAT. OFF.

TITANOX
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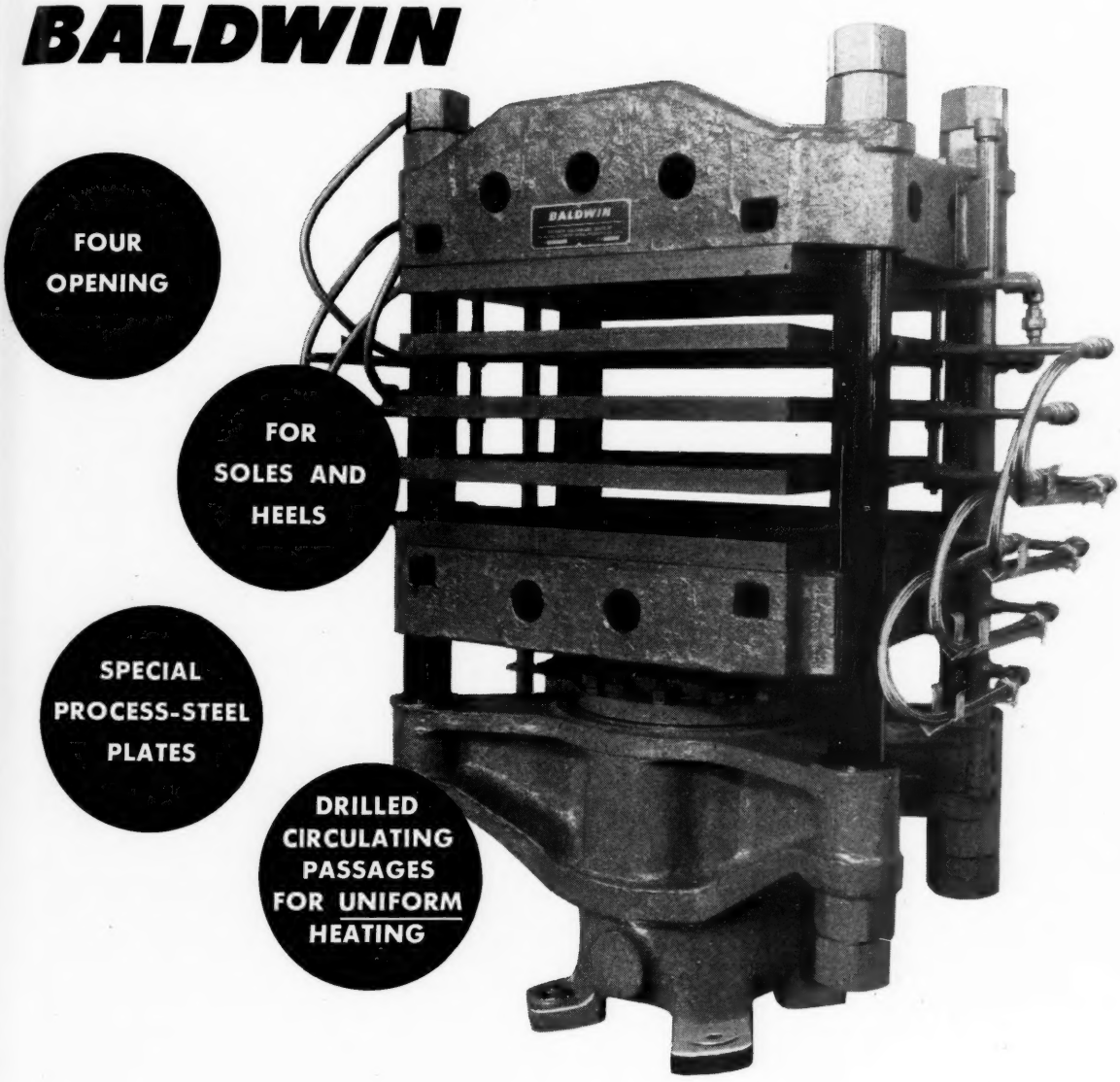
Another production stimulator from BALDWIN



Here's another new Baldwin press that is helping a large manufacturer to meet today's needs . . . and tomorrow's competition. One of the many quality features is the circulating system. Ducts are drilled from the solid metal, and properly spaced to give uniform heating. The unit is equipped with elevators, necessary hose connections, cast steel main members, ground columns, machined guides and separate inlet and exhaust manifolds. This press is especially suited for any process requiring heating and cooling.

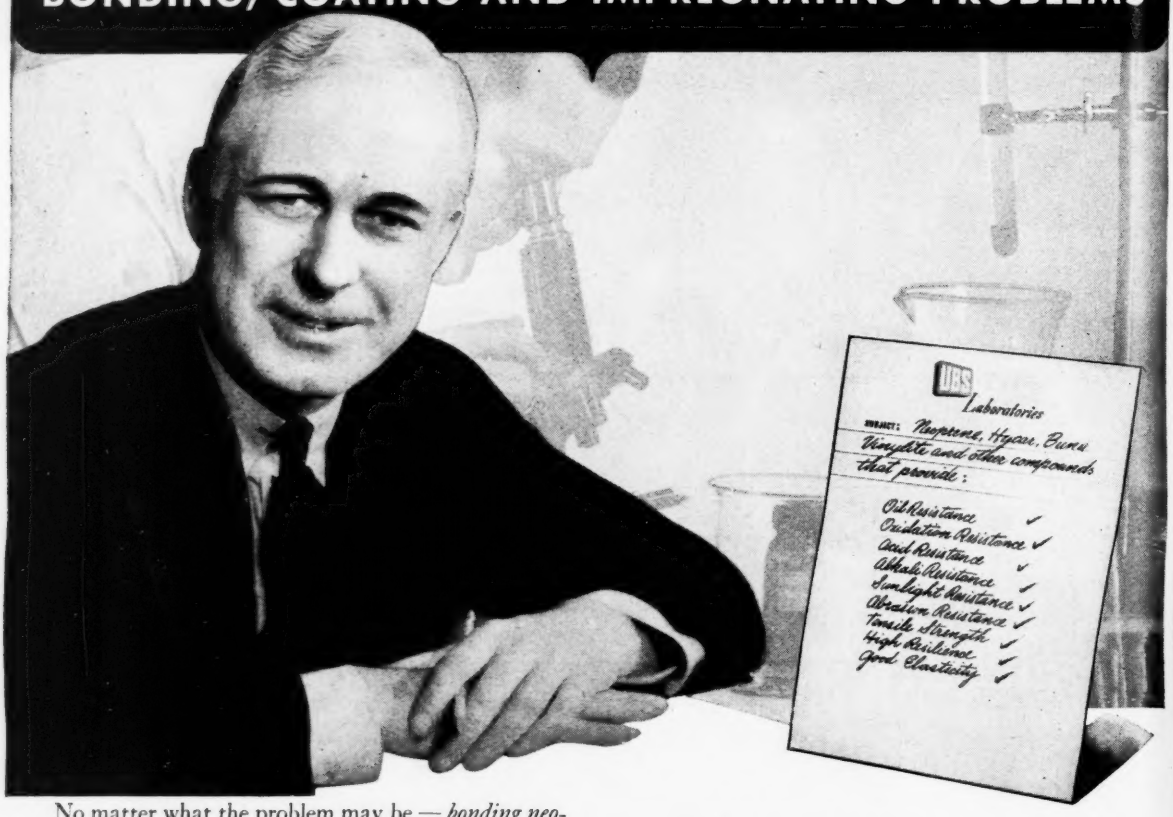
Baldwin presses are advanced in design, give you your postwar equipment *now*. Our engineers will design and build the press to do the job you have in mind. The Baldwin Locomotive Works, Baldwin Southwark Division, Philadelphia 42, Pa., U. S. A. Offices: Philadelphia, New York, Chicago, Washington, Boston, Cleveland, St. Louis, San Francisco, Houston, Pittsburgh, Detroit.

BLW THE BALDWIN GROUP

BALDWIN

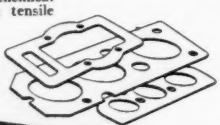
HYDRAULIC PRESSES

Consult THE UBS LABORATORIES ON POST-WAR BONDING, COATING AND IMPREGNATING PROBLEMS



No matter what the problem may be — *bonding neoprene, rubber and other coated or moulded parts to any ferrous or non-ferrous metal; corrosion proofing chemical tanks and equipment; laminating leather belting; coating magneto parts; combining or coating fabrics; impregnating paper; cementing various materials together; insulating wire and other articles; etc.* — you will find the UBS Laboratories equipped to provide (or develop) a formula that will fill your needs. Long-time specialists in the field of industrial Bonding, Coating and Impregnating Compounds, the UBS Laboratories not only know thoroughly the compounding advantages and limitations of all the latest synthetics, but even have developed an original synthetic latex and synthetic rubber of their own. *Write today, describing your Bonding, Coating, or Impregnating Problems.*

UBS developed adhesives are being used in the manufacture of inflatable Army and Navy Equipment, where weather and chemical resistant seams of high tensile strength are required.



UBS developed compounds are being successfully used to coat magneto parts and for cementing gaskets, where oil resistance is of great importance.

UBS developed adhesives and coating compounds are being widely used on Army delousing bags, protective clothing, etc., where acid resistance and flame resistance are of paramount importance.

UBS developed compounds are being used for chemical tank linings and to corrosion proof chemical handling equipment, where acid resistance and alkali resistance are primary factors.

Address all inquiries to the Union Bay State Chemical Company, Rubber Chemicals Division, 50 Harvard Street, Cambridge 42, Massachusetts.

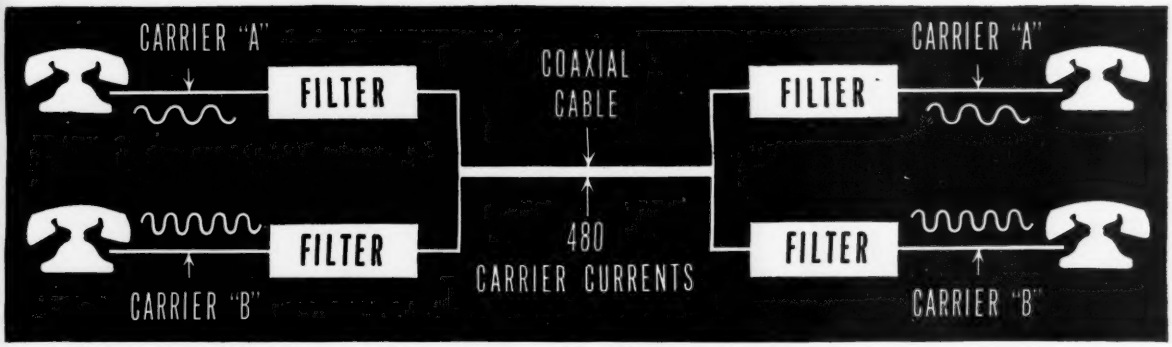
UBS

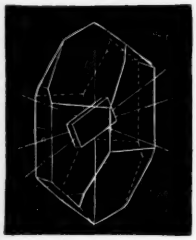
UNION BAY STATE
Chemical Company

Serving Industry with Creative Chemistry

ORGANIC CHEMICALS · SYNTHETIC LATEX · SYNTHETIC RUBBER
PLASTICS · INDUSTRIAL ADHESIVES · DISPERSIONS
COATING COMPOUNDS · IMPREGNATING MATERIALS · COMBINING CEMENTS

Crystal gateways for your voice





Four hundred and eighty telephone conversations over a coaxial cable was one of the last peacetime achievements of communication research in Bell Telephone Laboratories. In this multi-channel telephone system, each conversation is transported by its own high-frequency carrier current. At each end of the line are crystal gateways; each opens in response to its own particular "carrier" with the message it transports. In telephone terminology, these gateways are filters.

The ultra-selective characteristic of these filters is made possible by piezo-electric quartz plates, cut in a special manner from the mother crystal, and mounted in vacuum. Each set of plates is precisely adjusted so that the filter responds only to the frequency of its assigned channel, rejecting all others. In the coaxial terminal equipment, such crystal gates sort out messages for delivery to their four hundred and eighty individual destinations.

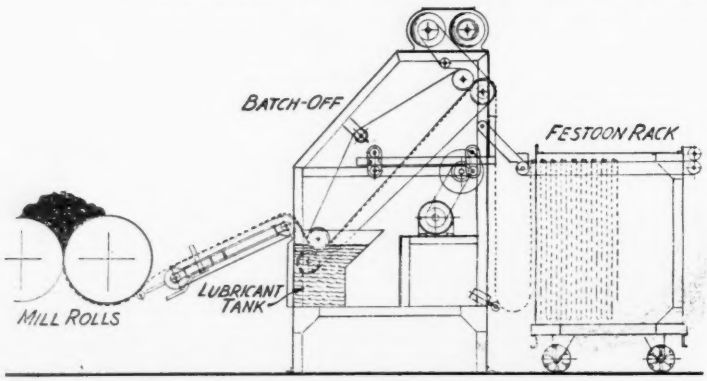
In recent years, Bell Telephone Laboratories research has provided the Armed Forces with many types of electrical equipment in which frequency is controlled by quartz crystals. Notable is the tank radio set which enables a tank crew to communicate over any one of 80 different transmission frequency channels by simply plugging in the appropriate crystal. The future holds rich possibilities for the use of quartz crystals in Bell System telephone service.

BELL TELEPHONE LABORATORIES

Exploring and inventing, devising and perfecting for our Armed Forces at war and for continued improvements and economies in telephone service.

AUTOMATIC MILL BATCH-OFF MACHINE

A Big Time and Labor Saver for the Rubber Industry



U. S. Patent 2,102,453

Why lose valuable mixing time slabbing off by hand when it can be done automatically?

At last you are able to reduce that Banbury cycle.

One more of your synthetic rubber problems solved.

Write Today for Full Particulars

The Akron Standard Mold Co.

Akron — "The Established Measure of Value" — Ohio

HEVEATEX

Agents of Rubber Reserve Company for Natural Latex. Distributors of GR-S Latex

Rubber Latex Compounds
Synthetic Rubber Latex Compounds
Synthetic Resin Compounds and Adhesives
Synthetic Latex Adhesives
Aqueous Dispersions of Reclaimed Rubber

•

Write us for further information

Trade Mark

HEVEATEX CORPORATION

78 GOODYEAR AVE., MELROSE, MASS.

CHICAGO, ILL., First National Bank Bldg. AKRON, OHIO, Ohio Building

Trade Mark

TO HELP CURE THE JAP WE MUST USE CURED SCRAP

$1,000. FOR THE BEST PAPERS ON THE UTILIZATION OF SYNTHETIC RUBBER SCRAP

The Jap thought he had crippled American Industry when he cut off our main sources of supply of natural rubber. He didn't. America now has its own rubber supply, thanks to synthetic rubber development on an unprecedented scale. However, the Jap left us with one unsolved problem: The utilization of synthetic rubber scrap. If you enter this contest and tell us how you think this scrap rubber can best be utilized, you may win up to $500.

FACTS ABOUT THIS BIG CONTEST

A group of rubber technologists identified with the rubber industry, known as the Chicago Rubber Group, is offering three prizes, totaling $1000.00 for the best papers on the utilization (reclaiming and processing) of cured synthetic rubber scrap. While the papers may deal with any phase of the problem, here are some subjects which suggest themselves: 1. Separation and segregation of synthetic scrap rubber. 2. Methods of identification of synthetic scrap rubber. 3. Reclaiming of synthetic scrap rubber. 4. Compounding studies which will result in greater use of reclaimed synthetic scrap, or of ground synthetic scrap rubber.

First prize: $500.00; second prize: $300.00; third prize: $200.00.

If you feel that you have ideas of value for this contest, be sure to enter! You may win one of these substantial cash prizes.

READ THESE SIMPLE CONTEST RULES

THIS CONTEST is open to anyone in the United States or Canada excepting officers and directors of the Chicago Rubber Group for 1943-45. Selection of subject matter is left to the discretion of the contestant. Papers should be based upon information which has not previously been presented before any technical society meeting or published in any trade magazine. Contest closes at midnight on August 1, 1945. Awards will be made during the fall meeting of the American Chemical Society in Chicago, 1945. The decision of the judges will be final. Each author must submit three copies of his paper to Mr. A. R. Floreen, Vice President, City National Bank & Trust Company, 208 S. La Salle Street, Chicago. These three copies will be judged separately by the Rubber Manufacturers Association, the Rubber Reclaimers Association and the Rubber Division of the American Chemical Society. The judges will report their findings to Bruce W. Hubbard, Chairman, Chicago Rubber Group, 2512 W. 24th Street, Chicago, to whom all inquiries for additional information should be addressed.

***Sponsored by* CHICAGO RUBBER GROUP, Chicago**

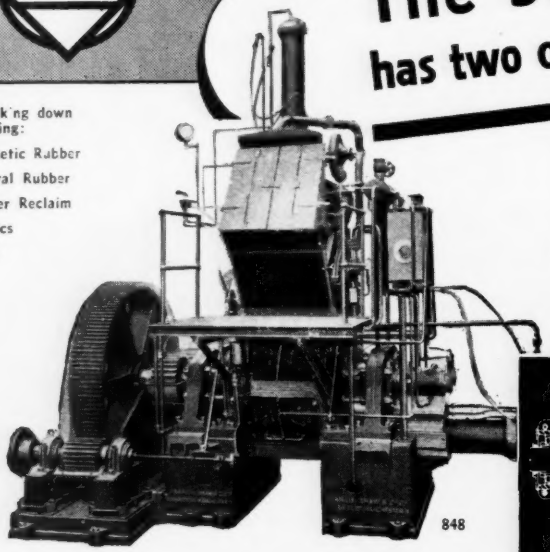
Space donated by THE NEW JERSEY ZINC COMPANY

SHAW

The SHAW Intermix has two outstanding advantages

For Breaking down and Mixing:

- Synthetic Rubber
- Natural Rubber
- Rubber Reclaim
- Plastics
- Paint



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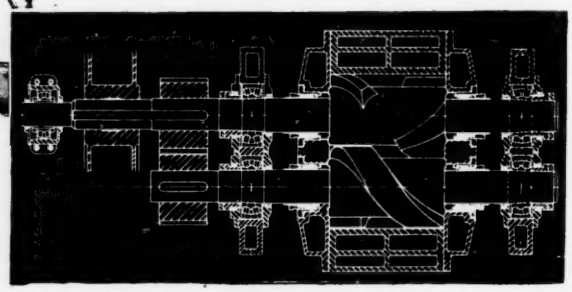

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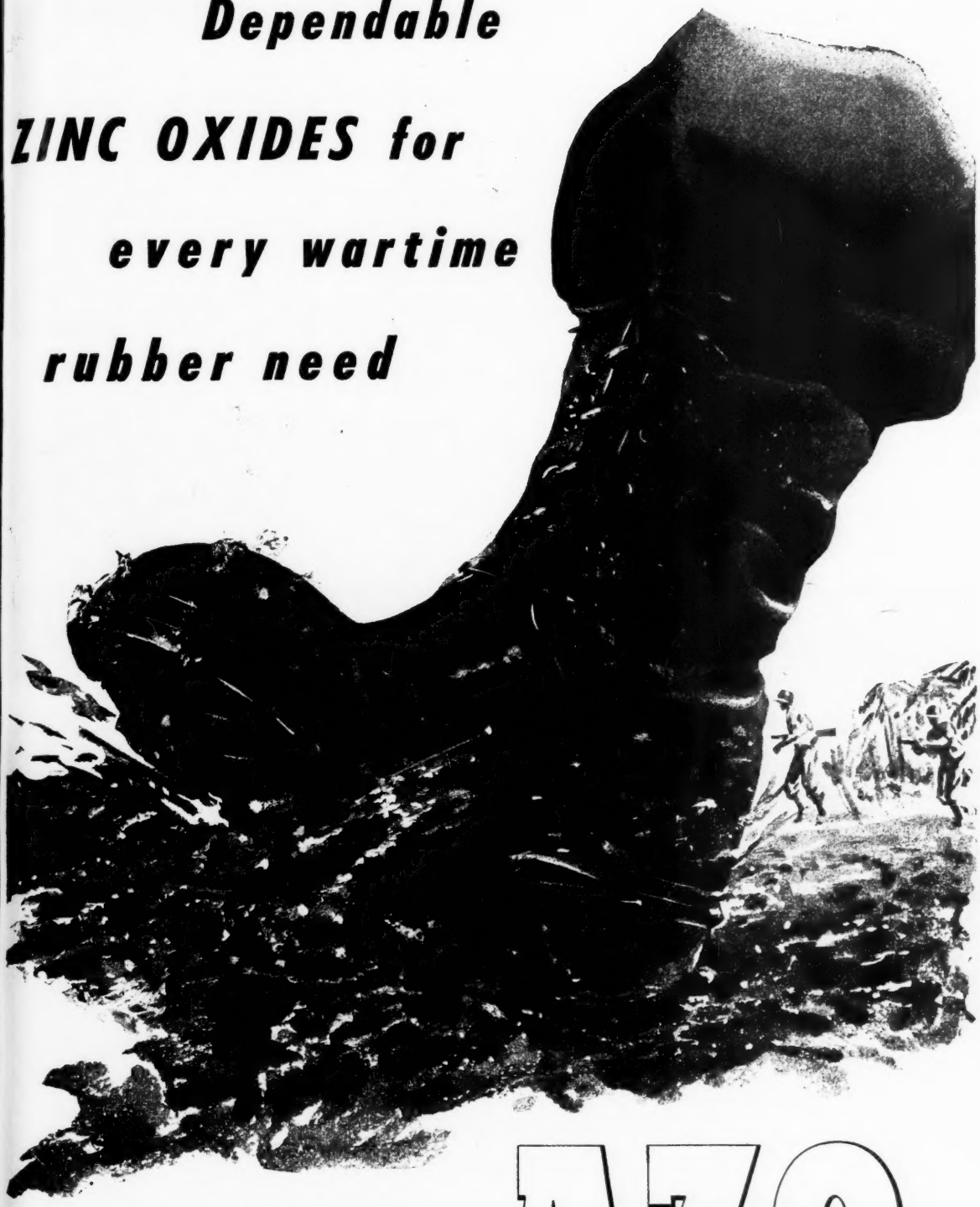

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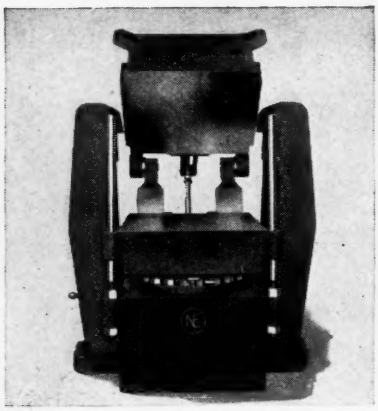

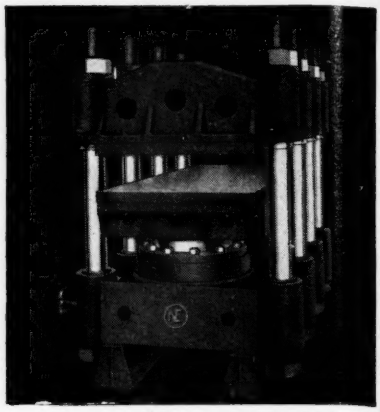

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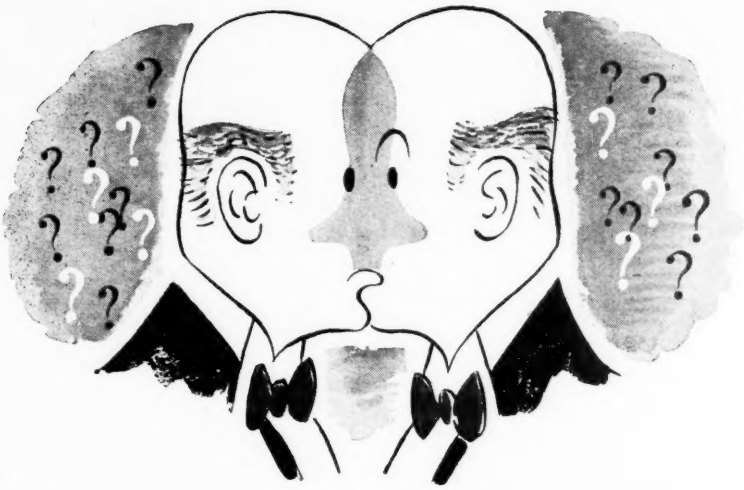

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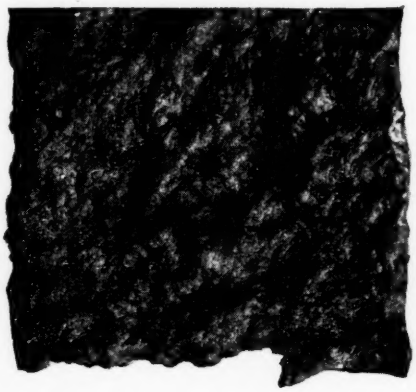

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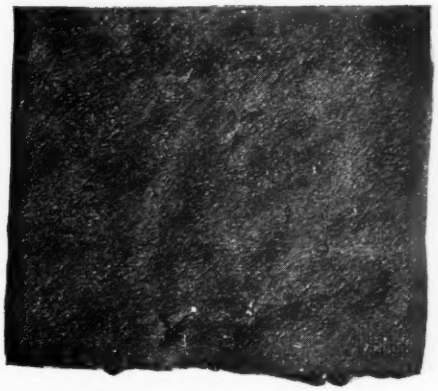

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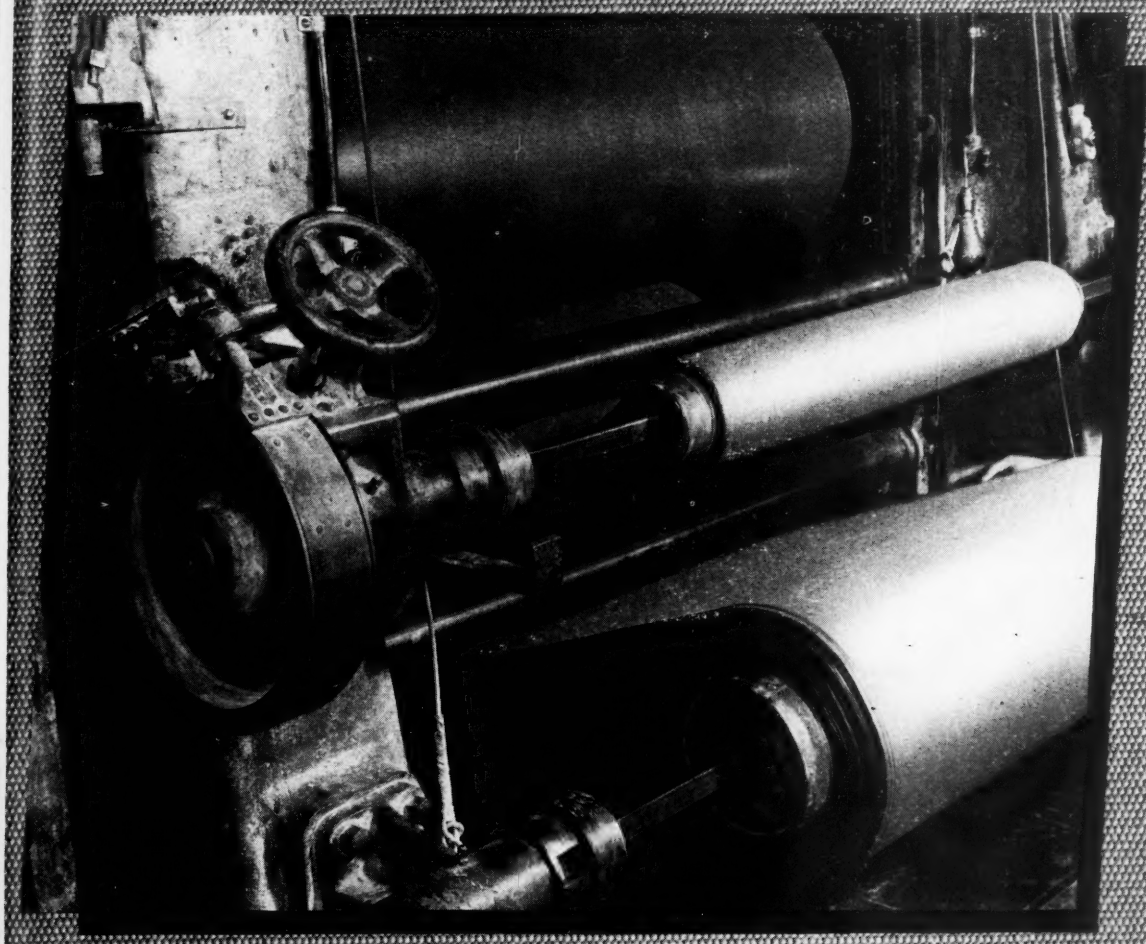

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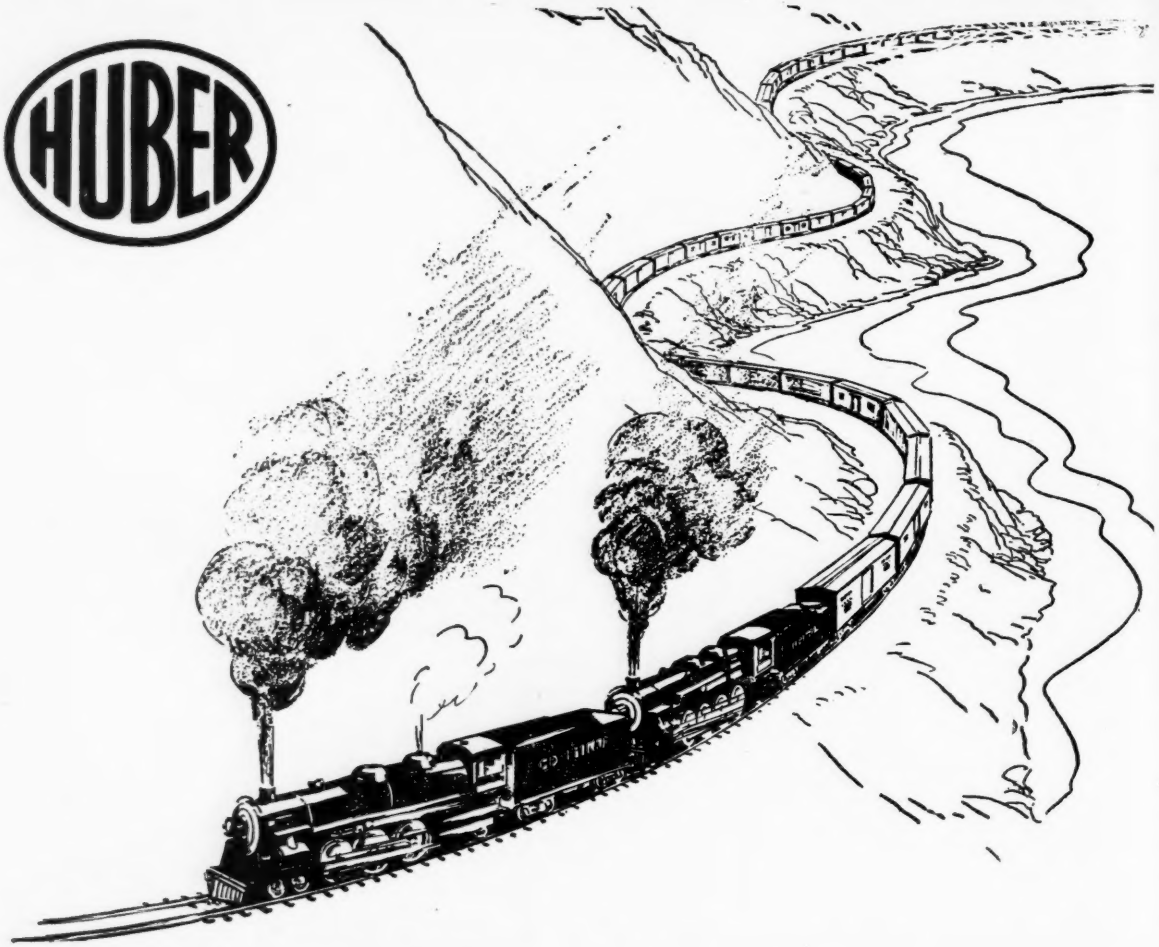

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Volume 112 | **New York, April 1945** | **Number 1**

Synthetic Rubber Mechanical Parts In Present and Postwar Vehicles—I[1]

Ellwood F. Riesing[2]

SYNTHETIC rubber is here to stay! It is here to stay as an engineering material, to be fully utilized for definite engineering application. It is here to stay for mechanical parts on automobiles, trucks, tractors and airplanes, not as a rubber substitute, but as an essential required engineering material. Never again will natural rubber be used for hundreds of different mechanical parts, because synthetic rubbers are already outperforming natural rubber parts on specific applications. We will all agree that the development of synthetic rubber is practically in its infancy when compared to the years of development of the art of natural rubber compounding. Furthermore much can be looked forward to in the immediate postwar years in the way of further improvement in compounding technique and in the development of new synthetic elastomers.

All of the synthetic rubbers, that is, synthetic elastomers, are tailor-made, long-chain molecular arrangements of high polymers, with molecular weights ranging as high as several hundred thousand. They represent the product of polymerization phenomena, and the wonders of this mechanism of polymerization for synthetic rubbers have just begun. While any one of the tailor-made elastomers does not possess all of the properties that we want built into one synthetic rubber today, several of them have already made natural rubber take a back seat in certain specific applications. In fact I feel safe in predicting that with the rapid development now going on in this field, there are definite possibilities of further improving and perfecting entirely new synthetic elastomers, which will possess properties greatly superior to the present ones now in production. The rubber industry should then be able to give you, as vehicle manufacturers, tailor-made materials with tailored-to-order physical properties for specific applications.

As pointed out recently by one of our country's outstanding chemists, the present synthetic rubber progress is probably the greatest organic chemical and chemical engineering project ever attempted in this country and perhaps in the entire world. The present development would be considered a remarkable achievement even if it had taken place in the normal course of events, but under present circumstances it has been a stupendous undertaking.

Think what would have happened to our entire united war effort, had we had an unlimited supply of natural rubber, but none of the synthetics, with their amazing properties providing the wonderful resistance to oils, gasolines, solvents, chemicals, gases, ozone, sunlight, flame, heat, cold and flexing, that enabled us to build mechanical parts that are giving unbelievable performance in planes, tanks, guns, and amphibian units, as well as sea-operating craft.

Each of us has been so absorbed in his own way, in helping in the united effort of winning this war that, more or less, we may have taken for granted some of the remarkable advances and discoveries that have occurred right in our own fields. Taking these wonderful developments with little question, in our eagerness to develop our war items, we may have overlooked their outstanding applications for the postwar automobiles, trucks, tractors, and airplanes. In fact synthetic rubber permits the use of rubber-like materials where natural rubber could never be considered.

By means of this paper I am, therefore, endeavoring to familiarize you with the properties of various synthetic elastomers on the market today, that is, their static and dynamic properties and their resistance to various conditions. I am also predicting what may be made available in the postwar years in the way of particularly desirable physical properties in special-purpose synthetic elastomers.

Technical papers and news articles have been delivered and printed by the dozens in the past year dealing with the chemistry of, and ingredients used in manufacturing synthetic rubbers, and long explanations on the chemical processes have been given.

Before preparing this paper we counseled with various engineers in your industries to determine just what phase of the synthetic rubber field they were interested in knowing more about. It was the consensus (of the men contacted) that the only information on synthetic rubbers generally made available to them or to their organizations was limited to room temperature data on conventional physical properties, and these were only static studies such as ultimate tensile strength at room temperature, elongation at rupture taken at room temperature, and compression set. With full realization of the fact that highly functional synthetic rubber mechanical goods parts demand that the designing engineers have full knowledge of the synthetic elastomer compounds they plan to use, these men have requested data at operating temperatures and not at room temperature, on such properties as: resilience,

[1] Abstracted from paper presented at the War Engineering-Annual Meeting of the Society of Automotive Engineers at the Book-Cadillac Hotel, Detroit, Mich., Jan. 8 to 12, 1945. Final paper copyright 1945 by Firestone Industrial Products Co.

[2] Chief automotive engineer, Firestone Industrial Products Co., Akron, O.

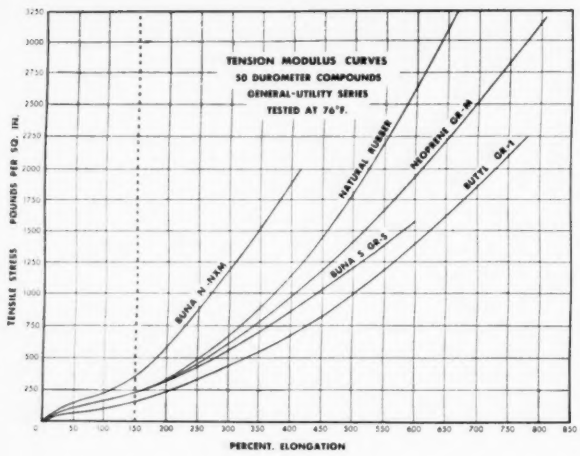


Fig. 1

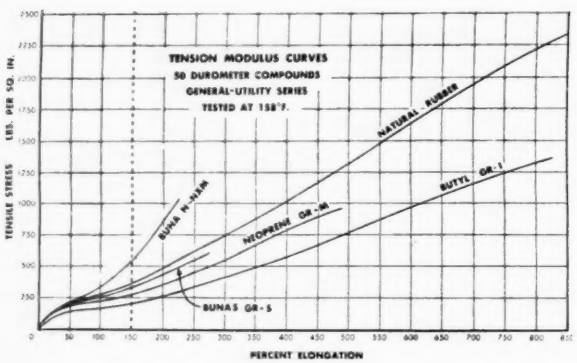


Fig. 2

dynamic modulus, both in shear and compression, static modulus, both in shear and compression, tension modulus at specified elongations, creep, hardening, and also data on low temperature stiffening and brittleness. A few of these men had become thoroughly disappointed with some of the synthetic rubber compounds because of the inferior performance observed when substituted in designs previously calculated from knowledge of the properties of natural rubber. Unfortunately the changeover from natural to synthetic rubber in the substitution program of prewar designs is not so simple as just specifying the use of synthetic rubber, or even narrowing it down to one specific synthetic elastomer. The properties of synthetic rubbers are, fortunately, and not unfortunately, vastly different from natural rubber, over a range of conditions. A very complete study should be made when attempting to replace natural rubber with synthetic rubber in old design parts. In many cases alterations of the design and most certainly the dimensions are necessary for successful operation and performance.

We have endeavored to meet this unanimous request as made by the men contacted, not only by the presentation of synthetic rubber data in this paper, but also by demonstrating some of their physical properties with specially built equipment, to give you visual proof of the superiority of some of the synthetic rubber compounds over natural rubber compounds for mechanical rubber goods parts. In giving these data, obtained by these tests, we want to make it thoroughly understood and to emphasize especially the fact that a goodly number of the properties of any mechanical goods synthetic rubber stock are dependent on the compounding ingredients and the compounding technique. Therefore if you have some synthetic rubber mechanical goods parts not performing satisfactorily, do not blame the lack of success on that particular basic synthetic elastomer. Much can be accomplished by correct compounding. As an illustration, we can refer to one particular application where a GR-S compound

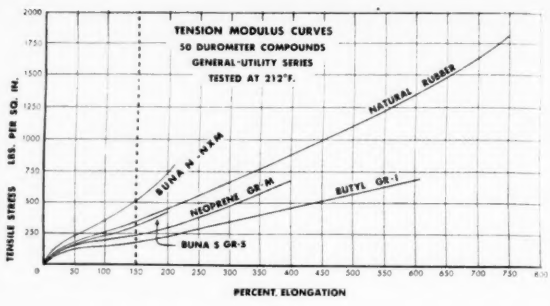


Fig. 3

showed flexing fatigue failure after 9,000 cycles; however, using the same elastomer, but with an entirely different compounding technique, the flexing life was brought up to 99,000 cycles, an improvement of 1,000%. Synthetic elastomers are much more sensitive to the art of compounding than is natural rubber.

To simplify this paper, however, we have limited our data for the most part to the properties of five general-utility mechanical goods stocks, compounded from the indicated basic synthetic elastomers available commercially on the market today. Unless otherwise specified, reference will be made in this paper to these five Firestone compounds, all of 50 durometer hardness, and all compounded for the best tensile, elongation, and compression set combination. (Four synthetic elastomer compounds and one prewar natural rubber compound for comparison.)

Many of you in the automobile, truck, tractor, and aircraft industries in the prewar years may not have been too concerned with the effect that temperature has on the static and dynamic properties of natural rubber. Temperature, as we will illustrate, greatly changes properties—both of natural rubber compounds and synthetic rubber compounds. The influence that temperature has on the static and dynamic properties of the synthetic rubbers that are available today is much more pronounced than on natural rubber; therefore the designing engineer must not only have full knowledge of the temperature range in which his designs are to function, but must know at what temperatures the maximum and minimum stress occurs in the synthetic rubber parts under consideration.

In this paper we have not included the polysulphide "Thiokol" or the large group of flexible plastics made from the various vinyl derivatives, because this group lacks the resilient characteristics needed in parts under appreciable mechanical action. The group is a study of its own and has some very interesting properties.

This paper is not being organized at this point in the manner usually employed in discussing synthetic rubbers by referring to one synthetic elastomer at a time with its respective properties. We felt that from the viewpoint of being helpful in a practical way to the designing engineer the organization according to property studies would be much more desirable.

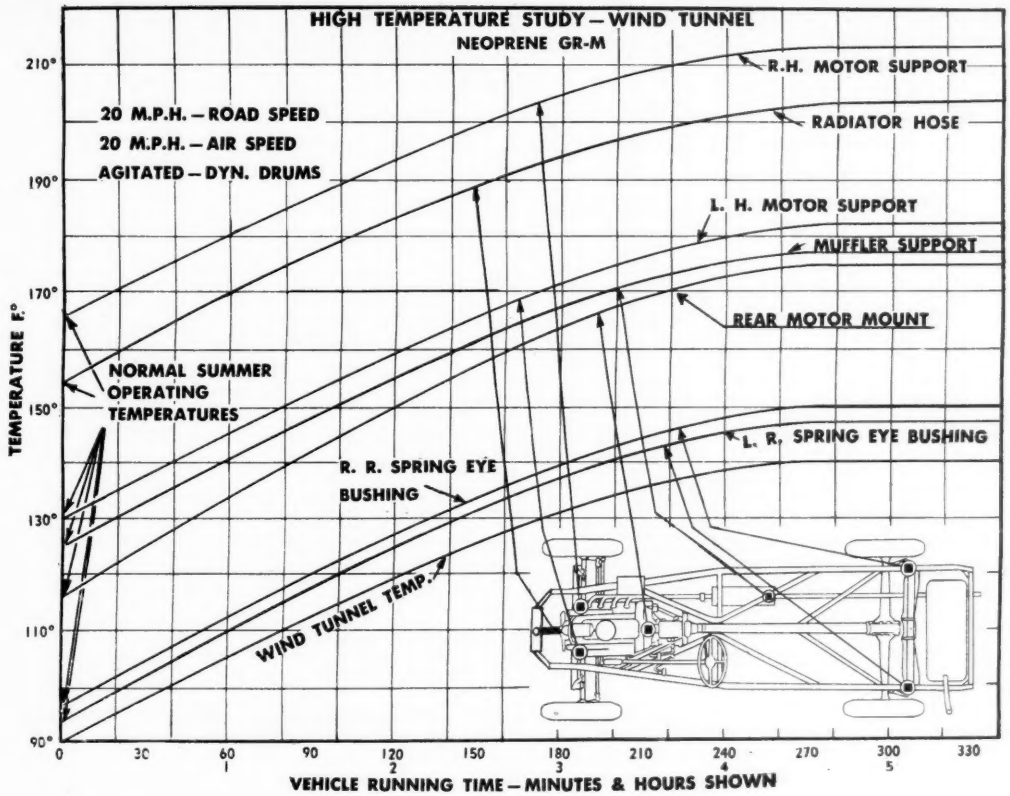
Study of Operating Temperatures and Tension Modulus at Operating Temperatures

Table 1. Conventional Physical Properties—Five General Utility Series Stocks—50 Durometer Compounds

Properties	Natural Rubber RN530	Neoprene (GR-M) SC530	Buna S (GR-S) RS515	Buna N (Butaprene) NXM SB515	Butyl (GR-I) RS520-6
Tensile—p.s.i.—76° F.	3300	3175	1650	1900	2200
Elongation—76° F.	670	800	600	440	790
Shore Hardness—76° F.	50	49	50	51	49
Compression Set Method "A" — Constant Load	11.1%	19.0%	11.5%	6.4%	14.5%
Compression Set Method "B" — Constant Deflection	22.0%	31.0%	20.4%	17.3%	18.0%

The conventional method of specifying properties for mechanical rubber goods compounds today is no different than it was 30 years ago. Tensile values are still expressed in lbs./sq. in. at rupture tested at room temperature. Elongations also are still expressed at rupture at room temperature. Table 1 shows these conventional physical property values as called for by the standard SAE-A.S.T.M. classification method on the five Firestone

Fig. 4



general-utility series stocks of 50 durometer compounds used in this paper.

Actually not one of the highly functional mechanical rubber goods parts on your automobiles, trucks, tractors, or airplanes operates at room temperature only. Consider, for example, the operating temperature of motor supports, fan belts, muffler insulators, water pump seals, radiator hose, engine throttle insulators and others. How, then, can correct comparison evaluations of compounds be made with property data given only at room temperature when these very properties, especially of synthetic elastomers, change their slope and cross over each other at different temperatures?

The conventional room-temperature property studies alone do not permit complete evaluation of the synthetic elastomers commercially available today for your industry, which will be continued in use along with new synthetic elastomers after the war. We recently carried on additional work of investigating and measuring more thoroughly the operating temperatures on various highly functional automotive mechanical rubber parts, and some of the recorded operating temperatures are astounding. Automobile motor mountings, as an illustration, on vehicles operating in some of our hot southern states build up temperatures of 150° to 180° F. On some of the desert runs they build up temperatures as high as 214° F.

Tensile pulls and their respective elongation, as we have said, have been, and still are, expressed at rupture at room temperature. However all highly functional resilient insulator design parts have their movements limited mechanically, and it is therefore not logical to study only ultimate tensile values. None of the vibration isolation designs or insulator devices employed today on vehicles allows movement much beyond 100% elongation at operating temperatures. Most of them function at 15% to 30% elongation, so why study tensile values at rupture at room temperature where elongations run to 800% or more? Tension curves for synthetics and natural rubber compounds are not linear functions and therefore show amazingly different tension modulus values in the lower elongation ranges, which are encountered under actual working conditions.

The conventional study of tensile strength at rupture would condemn some of the synthetic elastomers that are today actually giving amazing performance, some of which are definitely giving better performance than natural rubber compounds. It is my opinion that tensile values at rupture are no index whatsoever of the performance ability of a compound, but are merely an index of tear resistance. This is susbtantiated by our study made by the A.S.T.M. and Cooper method of tear resistance determination. For mechanical rubber goods parts the tensile property, "tension modulus," should be studied at specified elongations and temperatures.

The conventional 30-year-old method of just expressing tensile values and elongations at rupture at room temperature, as tabulated for our five general-utility stocks in Table 1, was not adequate for prewar natural rubber compounds, and most certainly is not the method correctly to evaluate synthetic elastomer compounds of today. Figure 1 plots the complete stress-strain curve through the entire elongation range to rupture, at room temperature. Notice that the slopes of the curves for these five compounds are not only vastly different at high-strains approaching rupture, but have decidedly different slopes in the low-strain actual operating range of 25% to 150% elongation. Figures 2 and 3 plot the tension stress-strain curves on the same compounds for temperatures of 158° and 212° F., respectively. Note the difference again in the slope of these curves in the high-strain end approaching rupture, compared to the low-strain region in which these compounds are actually called upon to function in the mechanical parts on your vehicles.

We have dotted the 150% elongation line in Figures 1, 2, and 3 so that you may observe the effect that elevated operating temperature has on these five different stocks. The prewar natural rubber 50 durometer stock, you will observe, has the same tension modulus at 150% elongation as does neoprene (GR-M) and Buna S (GR-S); however the raise in temperature to 158° and to 212° F. stiffened the modulus of the natural rubber and the Buna S (GR-S) in this low-strain actual operating range, but did not noticeably change the tension modulus of the neoprene (GR-M) compound. The stability of this neoprene compound is therefore better suited and more ideal for motor mountings or other parts operating under these indicated temperature conditions. The studying of these tension curves at rupture will give you an entirely different picture, one that definitely is not

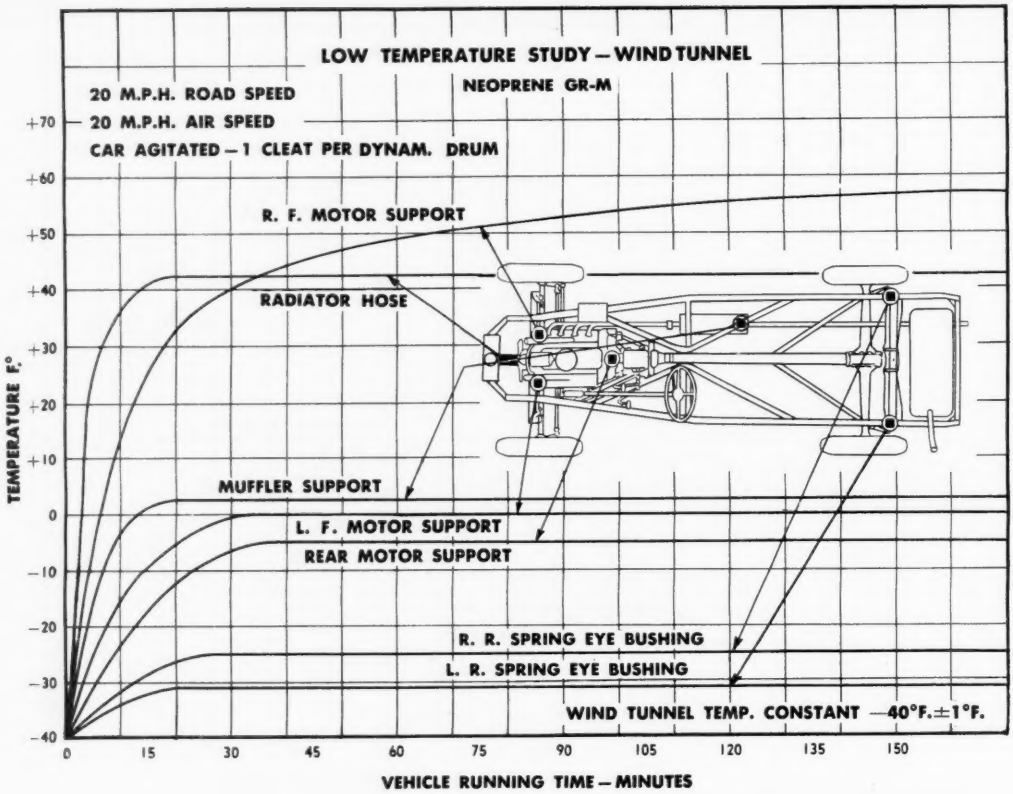


Fig. 5

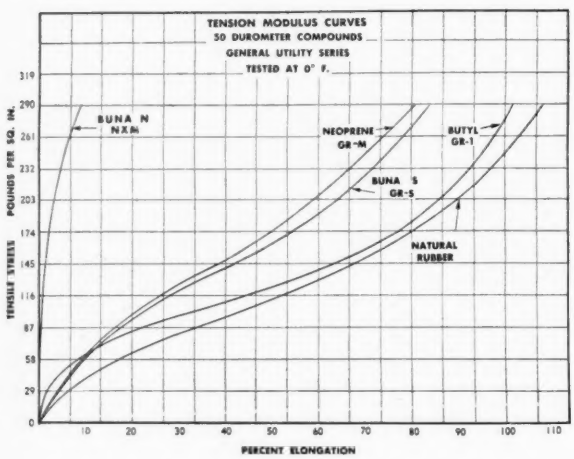


Fig. 6

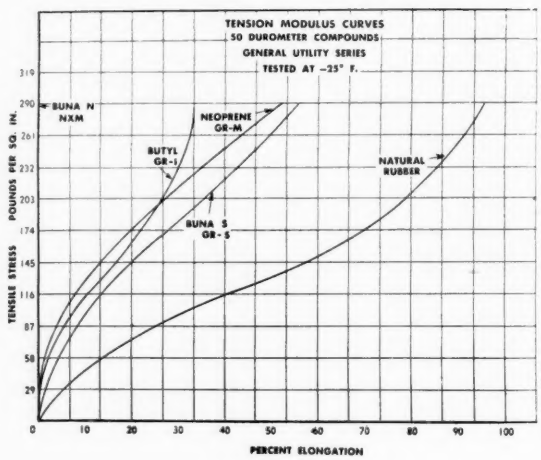


Fig. 7

applicable for practical evaluation of these compounded elastomers for mechanical parts, which work at low-strains under these temperatures. Observe also the change in the order of the tension modulus at rupture of natural rubber, Buna S, and neoprene from room temperature of 76° to 158° and 212° F., showing Buna S with a lower tension modulus than neoprene at room temperature, and reversing the order at 158° and 212° F. by showing a tension modulus stiffer than neoprene.

We have emphasized in this section that for practical evaluations of compounded elastomers, the property of tension modulus should be studied at the elongations and temperatures at which they operate. Since all highly functional resilient vehicle parts have their allowable movements mechanically limited, there is no need to discuss further the necessity of appraising the compounds under consideration, in the 150% elongation region at the specified operating temperature instead of only at the conventional rupture point.

Operating temperatures of highly functional synthetic rubber mechanical parts with the proper equipment can readily be measured on the vehicle where it is in operation, but to the uninformed, these temperatures are startling. Inasmuch as considerable effort has been put forth to get this temperature data for this paper and since we have so emphasized operating temperatures, we have plotted the temperature curves on a half dozen well recognized parts. Figure 4 shows the heat attained in the indicated parts accurately measured in the Ford Motor Co.'s elaborate wind tunnel under high-temperature desert-simulated operating driving conditions.

Note that while the vehicle is in operation, motor supports, because of their being confined under the car hood, build up to higher temperatures than do muffler insulators supporting the extremely hot muffler pipe; the latter, of course, are located where

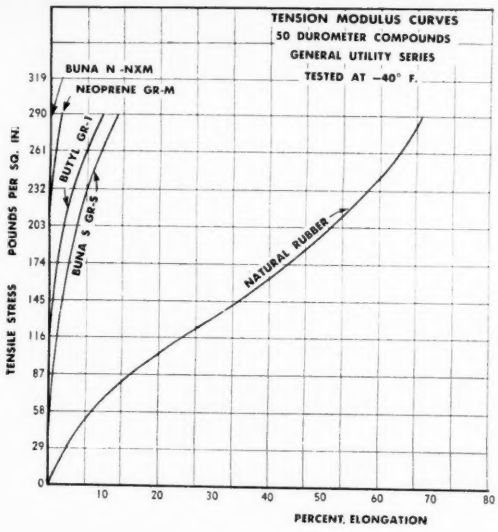


Fig. 8

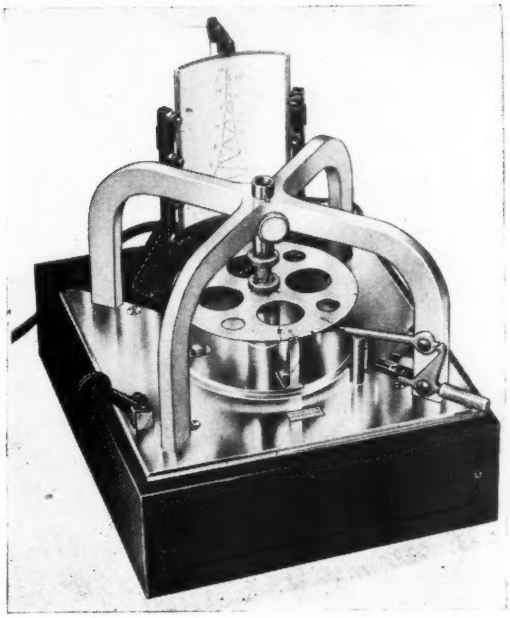


Fig. 11. Firestone Autographic Torsional Pendulum

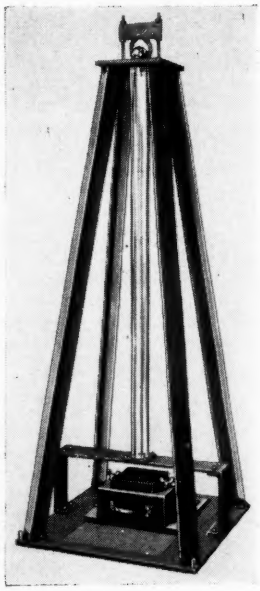


Fig. 9. Ball Rebound Device

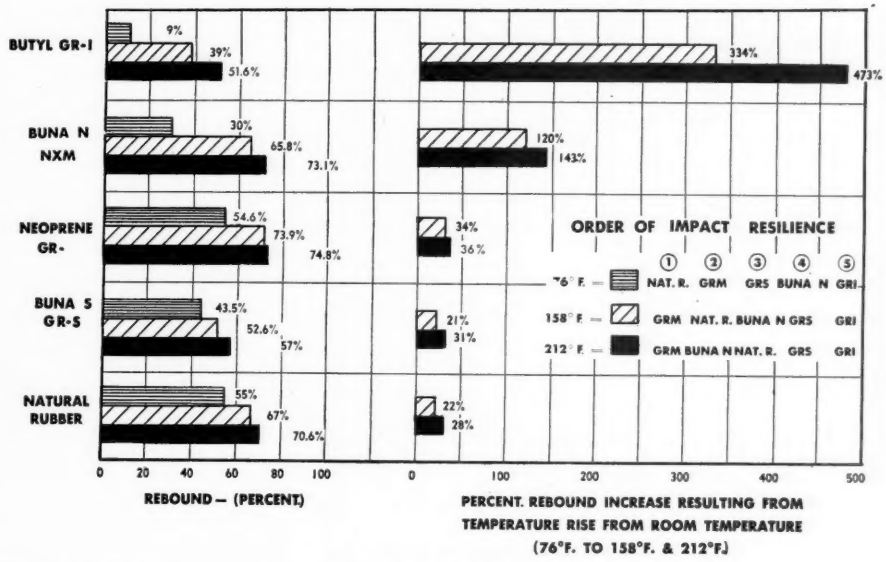


Fig. 10. Ball Rebound Resilience Test—Five General-Utility Series Stocks, 50 Duro Compounds

the air freely circulates when the car is in motion.

The sub-zero operating conditions likewise were investigated by the author and worked out in cooperation with Ford's engineering department. These tests have definitely proved that the highly functional parts rapidly warm up because of the internal friction of the compounded elastomer, plus heat transferred from warmer regions by conduction and convection.

The initial test to prove this "warm up" was run by having the vehicle soak in a large refrigerated room at —40° F. for 48 hours. With the engine started, and running under this low temperature condition, all of the functional parts under the hood rapidly warmed up within the first ten minutes of car operation. The temperatures built up so rapidly with the vehicle under these conditions in the still air of the refrigerated room (which would be comparable to an average car owner warming up his car at the curb) that we decided to re-run the test under car operating conditions by using Ford's wind tunnel, simulating Alaskan sub-zero driving conditions. The wind tunnel was not cosidered origially because several days are required to lower the temperature to —40° F. The temperature in the tunnel averaged —40° F. at 20 m.p.h., transferring the energy to dynamometer rolls throughout the entire test run. The vehicle was soaked at this temperature for 48 hours before the test run. The air in the tunnel circulated at 20 m.p.h. and the vehicle operated in high gear equipped with cleats to cause suspension oscillation. Under these conditions the front motor supports and other synthetic rubber parts under the hood, and the muffler insulators, rear motor mountings, plus additional functional parts not under the hood still warmed up unexpectedly fast. The temperature build-ups under these actual running conditions are shown in Figure 5.

Tension modulus studies at low temperatures were also made on the five general-utility 50 durometer stocks. These studies were made at 0° F., —25° F., and at —40° F. (Figures 6, 7, and 8, respectively). A quick analysis of the plotted values shows an even greater change in order than occurred in the high-temperature study and brings out the low-temperature sensitivity of the general-utility synthetic elastomers. Had the author's practical investigation not been conducted in the refrigerator room and in the wind tunnel at —40° F., a very gloomy picture would have resulted from this study.

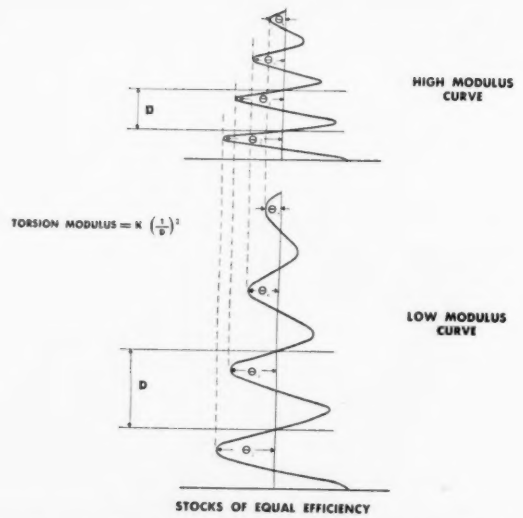


Fig. 12. Typical Autographic Torsional Pendulum Curves

The high- and low-temperature elaborate wind tunnel studies and the high- and low-temperature tension modulus studies should prove conclusively that for vehicle application of mechanical rubber parts, physical property studies at room temperature only are not adequate. This is true of both natural rubber and the synthetic rubbers.

Resilience

Resilience values of compounds at specified temperatures should be a "must-know" before final details and specifications are released on any design of impact absorbing devices, such as rubber springs, spring stabilizer insulators, frame insulators, axle bumpers, shock absorber insulators, engine stabilizers, instrument mountings, and aircraft landing gear parts.

Resilience of rubber-like materials in the layman's mind means fast springing back after bending; that is, the quantity of work given back by a body that is deformed to a certain limit and then allowed freely to recover itself, as a spring under pressure suddenly relaxed.

Resilience can be determined by several methods. However from the viewpoint of demonstrational ease, we have selected the ball rebound device, pictured in Figure 9. It is an excellent, easy way to draw comparisons between synthetic elastomers and natural rubber compounds and can be employed as an inexpensive production method of inspection of finished molded vulcanizates. Simple energy considerations based on the theory of free vibration show that the ball rebound device permits calculation of a factor which can be called "impact resilience." This value is expressed by dividing the first rebound height by the distance of the free fall:

$$\frac{H_1}{H_0} \times 100\% = \text{Impact resilience in } \%$$

Figure 10 shows in bar graph form this impact resilience in per cent. measured on the ball rebound device. Values shown are on our five Firestone stocks with the per cent. rebound given not only at room temperature of 76° F., but also at 158° and 212° F.

Attention should be drawn to the unusual change occurring in the Butyl stock which, at room temperature, has a rebound of only 9%, but after the compound has been heated to 212° F. has a value of 51.6%. This rebound at 212° F. is greater than Buna S rebound at room temperature. The neoprene compound, it should be observed, is approximately equal to the natural rubber at room temperature and exceeds the rebound of the natural rubber when both are heated to 158° F. The rebound of this neoprene compound also exceeds that of the natural rubber compound when both are heated to 212° F. Later in this paper, under the section on hysteretic and elastic properties, we refer to a copolymer of butadiene and styrene of a special ratio not allowed by the government for manufacturing in government-owned plants

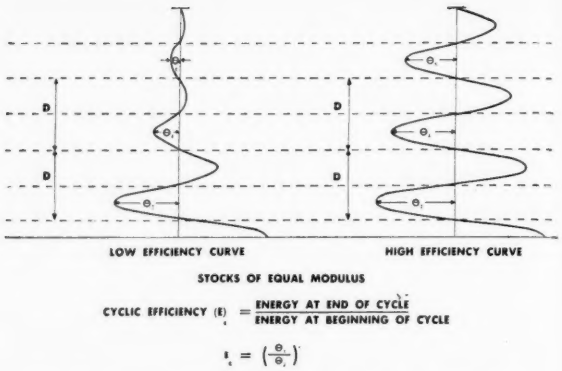


Fig. 13. Typical Autographic Torsional Pendulum Curves

today that has an impact resilience value measured by the ball rebound method exceeding that of natural rubber over the entire temperature range from —40° to 212° F.

The Buna N (Butaprene-NXM), a butadiene acrylonitrile copolymer, likewise shows a greater rebound than natural rubber at 212° F. The butadiene acrylonitrile copolymers have a high resilience at elevated temperatures, but comparatively poor resilient properties at low temperatures. Butyl (GR-I) shows the greatest increase in rebound resilience of all the elastomers resulting from the temperature rise from room temperature to 212° F., that of 473%, compared to 28% for natural rubber. Certainly there should be application where this property of Butyl can be utilized to its fullest extent, for example, as Butyl mountings in one form or another, where movement should be held to a minimum until the vibration system is fully warmed up. An exhaust pipe or muffler insulator is a good illustration, for the amplitude of movement of the exhaust pipe or muffler, when starting and warming up an engine, usually should be held down so as not to allow it to oscillate through maximum amplitude and make metallic contact through the rather restricted openings in the chassis cross-members. It should be noted here in this study that the compounded synthetic elastomer group gives a wider range of rebound resilience than do the natural rubber compounds.

Your attention should be called to the change in order of impact resilience values resulting from the change in temperature. Natural rubber, which is shown in (1) position as having the greatest impact resilience at room temperature, dropped to (2) position when the study was made at 158° F. and to (3) position when the values were measured at 212° F. Neoprene (GR-M), which had the (2) position at room temperature, jumped to (1) position for both 158° and 212° F. Buna N (NXM), which had the (4) position at room temperature moved to (3) position at 158° F. and to second position at 212° F. This definitely illustrates that our evaluations for impact resilience must be studied at temperatures at which the compounds will be employed under actual operating conditions since the order of impact resilience is different for each of the temperatures studied. Of the five utility compounds studied, neoprene excelled natural rubber on impact resilience at 158° F., and both neoprene and Buna N excelled natural rubber at 212° F., showing again some synthetic compounds more outstanding than natural rubber in a specific property study.

It should be noted here that impact resilience is dependent on both the internal friction and the modulus (stiffness) of the compound. It does not easily lend itself to quantitative efficiency expression. The torsional pendulum device, however, does give quantities from which internal friction and modulus evaluations may be calculated.

Efficiency

The torsional pendulum device permits calculation of the true efficiency of a compound since it separates internal friction from the modulus (stiffness) and, therefore, is a scientific method of evaluating compounds for low-frequency operating elements such as spring shackle bushings, sway bar bushings, stabilizer

(*Continued on page 66*)

Equipment for Tensile Testing at Elevated Temperatures

D. R. Scheu[1] and J. W. Schade[2]

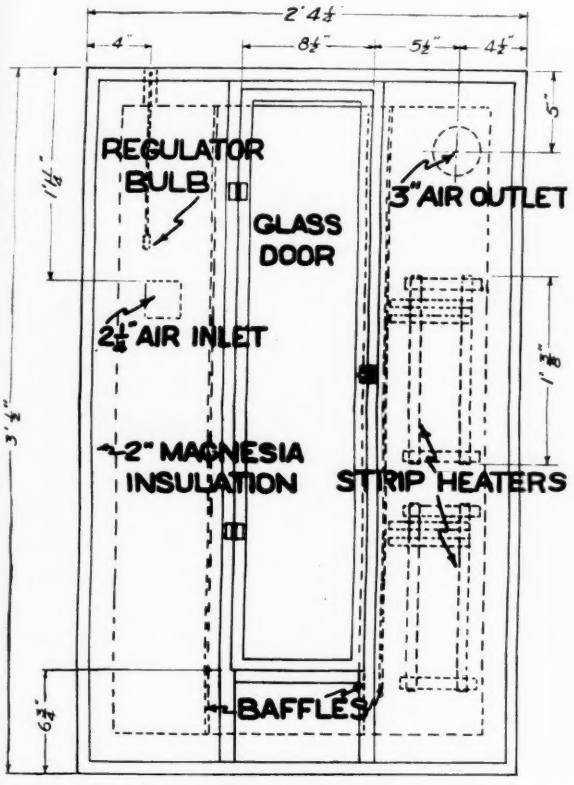


Fig. 1. Details of Elevated Temperature Cabinet for Scott Tensile Machine

Fig. 2. View of Cabinet Showing Elongation Scale and Windlass for Adjusting Trammel-Point Level

FOR the proper design of rubber compositions to be used at temperatures either above or below those resulting from natural weather conditions, the rubber technician needs data concerning the physical properties of compounds both at ordinary temperatures and at high or low temperatures, even beyond those obtained during the service of the articles. For obtaining reliable results it is necessary in either case to maintain the test specimens and those parts of the machine in which they are mounted, at the same uniform temperature during the entire testing period. This article describes equipment which has proved adequate over a period of years for tensile testing at elevated temperatures on Scott machines.

In 1938 the testing laboratories of The B. F. Goodrich Co. designed and constructed the first of these; and in the Summer of 1944 another unit, based on the original, but modified in a few unessential respects, was installed at the Government Synthetic Rubber Laboratories, operated by The University of Akron. The following description relates to the latter installation. The interesting features of the original unit not adopted in the second one will be mentioned thereafter.

Description of Apparatus at Government Laboratory

A Scott rubber tensile tester was adapted for testing at elevated temperatures by the addition of a three-compartment cabinet across the front, (Figures 1 and 2), extending from five inches above the top of the gear box to a height sufficient to include the upper specimen grip, a distance of approximately 42 inches. From the compartment to the left of the operator heated air is discharged into the central testing chamber, enclosing both the specimen grips. This compartment is provided with a glass door. In the right-hand section of the cabinet (Figure 3) are electrical heating elements which raise the air circulating through the cabinet to some predetermined temperature. Ordinarily tests are run at 212° F., but it may be desirable in special cases to test as high as 300° F. The heating elements in the Government Laboratories' equipment are Chromalox units, and the temperature is maintained by an adjustable regulator attached to the wall to the left of the cabinet.

The entire cabinet is built within a welded angle iron frame to produce the necessary strength and rigidity. The door is a welded steel frame supporting a pane of glass. The outer sides of the cabinet are removable to permit access to the heating and distributing chambers. All exterior walls are constructed of heat insulating material two inches thick mounted on hard, asbestos wall board. A duct, three inches in diameter, and a blower are mounted on the rear of the cabinet, near the top (Figure 3), to force the air from the heating chamber around the frame of the Scott tester to the distributing compartment. The duct and the blower should be insulated to reduce heat losses.

On each side of the testing chamber is a hard asbestos partition in which 11/16-inch holes are drilled on centers 2½ inches apart vertically and 1¼ inches apart horizontally. The temperature distribution from top to bottom was checked by trial and error. A number of thermometers were placed at different levels within the test chamber, and openings in the side walls were plugged

[1] Process engineer, B. F. Goodrich Co., Akron, O.
[2] Manager, government laboratories, operated by University of Akron, as agent for Rubber Reserve Co., Washington, D. C.

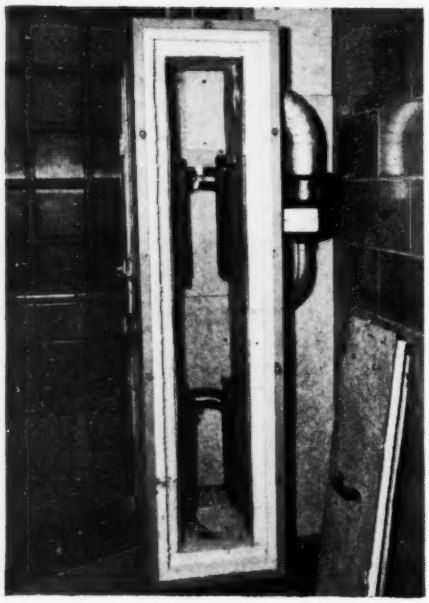


Fig. 3. Side View of Right-Hand Side of Cabinet Showing Heating Units

with corks as required to attain uniform temperatures from top to bottom.

In the air-heating chamber a solid panel of hard asbestos, extending from the top to a level 2½ inches above the bottom of the cabinet, is inserted 1¼ inches from the perforated wall. This panel (Figure 1) serves as a baffle between the heating elements and the wall of the test compartment. The air from the test compartment descends along the panel and then passes upward past the heating elements and then out through the duct and the blower.

The heating elements are mounted and connected in two banks of four 150-watt elements. The current, and therefore the temperature of the air, are controlled by the regulator mentioned above.

The control bulb for the regulator is situated just above the hot air inlet of the left-hand compartment at the horizontal center, approximately 10 inches from the top of the cabinet.

Elongation of the specimens in test is measured with a scale sliding vertically through a clip attached to the lower grip crosshead (Figure 2). The upper end of the scale is fitted with a trammel point to facilitate following the upper bench mark on the specimen. During tests the trammel-point level is changed, as required, by turning a small windlass mounted at the right of the door. This unwinds a fishline from which the scale is hung vertically. As shown in the photograph, the line passes from the windlass to the scale through a series of eyelets. In order to reduce the time consumed in bringing the specimens to required temperature, they are hung on three wire brackets inside the cabinets. Cardboard spacers are placed between the strips to prevent their touching one another. In Figure 2, strips are hanging on only one of these wires. The temperature within the test compartment is indicated on a thermometer suspended non-rigidly from the top of the cabinet approximately one inch to the right of the grips, with its bulb approximately one foot below the ceiling of the cabinet.

Ample clearance in the top of the cabinet is provided around the pull rod for the upper grip to prevent frictional contact. The heat loss at this point is not sufficient to affect the temperature inside the test chamber. The cabinet at the Government Laboratories was the first one to be installed on a chain loading machine. Experience shows, however, that operation at 212° F. has not affected the functioning of the dash-pot. Whether operation at higher temperatures would cause difficulties is not known. It might be necessary, under such conditions, to replace the leather cups with a more heat-resistant material. The controls of the machine are unchanged, for it is still possible to operate the pendulum, and the foot trip for grip return may still be pressed with the operator's toe.

It was found necessary, however, to change the chart adjusting handle which ordinarily extends below the level of the top of the heating cabinet. The vertical rod was cut at proper height, and a horizontal rod added to operate the vertical portion by means of miter gears. The operating handle extends to the left of the chart, at a convenient height for the operator.

Some Features of Goodrich Apparatus

The machine in the Goodrich laboratory is screw-driven, and no difficulty has been found in its operation with temperatures up to 300° F. The Goodrich machine also has double glass doors and a limit switch mounted on the door to break the blower circuit and to stop circulation of the air while the door is open. It also is equipped with an electric light bulb within the test chamber to illuminate the grip while the test piece is being inserted, but it is normally turned off to prevent irregular heating of the test pieces by radiation.

The heating elements in the Goodrich machine are somewhat differently arranged. They consist of three banks of 1500 watts each. The two lower banks are individually controlled by manual switches, and either one or both normally are operating continuously, depending upon the test temperature desired. The top element bank is controlled by a deKohtinsky thermo-regulator inserted through the top of the testing chamber.

Synthetic Rubber Mechanical Parts

(*Continued from page* 64)

bushings, torsion suspension springs, steering mechanism insulators, etc. The Firestone autographic torsional pendulum device illustrated in Figure 11 scribes a damped sinusoidal curve at the natural frequency of the compound that enables determination of the efficiency and modulus. Figure 12 shows two typical damped sinusoidal curves for different compounds. These curves, you will observe, show that the tested specimens have the identical efficiencies, but have considerably different modulus (stiffness) values.

This autographic torsional pendulum device is so built as to allow testing a small piece of stock cut from an engine support or other production part by merely grinding the cut part to a ⅜- by ⅜-inch cross-section. It is very accurate and capable of distinguishing small differences in vulcanized elastomers. This device, as well as the Yerzley oscillograph, permits measurements for efficiency calculation at elevated and depressed temperatures. The five general-utility 50 durometer stocks, when studied on the torsional pendulum device, which separates internal friction and modulus, show a different order in their respective efficiencies and moduli values than the ball rebound device revealed in the study of impact resilience where internal friction and modulus are not separated.

Figure 13 shows the torsional free vibration curves for two different stocks having the same basic elastomers compounded to produce the same modulus (stiffness) and the same durometer hardness; however you will observe that the efficiency values are considerably different. Efficiency should not be associated with the basic elastomer any more than it should be associated with Shore durometer hardness.

All pendulum free vibrators operate at low frequencies, and different compounds oscillate or vibrate naturally at different frequencies. Proof of this is evidenced by observing the natural frequency values discussed in the next installment of this article. Since internal friction varies with frequency, tests for compounds to be used in designs that operate in high-frequency ranges should therefore be studied at the frequencies approaching those of service, and to obtain comparable values one frequency should be used for any given comparison. These conditions of study for high-frequency operating designs may be attained with a resonance forced vibrator as developed by Firestone.

(*To be continued*)

The Compounding of Guayule Rubbers

Effect of Carbon Black Loadings

Frederick E. Clark[1]
and Wilfred F. L. Place[2]

WHEN the Japanese obtained control of more than 90% of our natural rubber supply, general interest was immediately focused on guayule as the only rubber bearing plant in Continental United States which had been used commercially to produce natural rubber. Since 1905 appreciable amounts of guayule rubber, up to 12,000 tons in a single year (1912) (1)[3] have been used for the special properties of ease of processing, plasticity, and tack which it imparts to a mix.

From 1910 to 1937 the United States' imports of guayule rubber from Mexico totaled 54,000 long tons, or approximately 0.6% of the total imports of crude rubber from all sources. The average price obtained during this period for guayule (resinous) was approximately 80-85% of the price paid for ribbed smoked sheet 1X plantation rubber.

The crude guayule rubber produced in Mexico and in this country before the present war was marketed under a single grade; the only exception to this was the differentiation introduced in 1927 by the Intercontinental Rubber Co. for its Duro and Ampar brands. Ampar was a superior grade for which a premium of 1½¢ a pound was asked. This lack of variety of grades is in contrast with the plantation rubber which is available in more than 30 different grades.

Early in 1942 the United States Government, through its agency the Guayule Emergency Rubber Project, purchased from Intercontinental Rubber Co. all existing guayule plantings and processing facilities already established in this country. Furthermore the Guayule Emergency Rubber Project considerably enlarged the existing planting and inaugurated a large research program.

The previous meager literature on guayule has recently been considerably enriched. In the field of rubber compounding the early studies of Spence and Boone (2) and Doering (3) have been supplemented with articles by Morris and coworkers (4-6) and Hauser and Le Beau (7).

An important and immediate objective of the Guayule Emergency Rubber Project was to improve the conventional pebble milling process in order to increase the percentage of recovery as well as to produce a rubber of better quality. A second objective was to devise new methods with the view of further improving the quality of the product.

The purpose of this report is to compare various types of guayule rubber on a gum formula and at several loadings of carbon black. All tests were performed on a comparative basis; the standards for comparison were similar stocks compounded from a good grade of *Hevea* smoked sheet.

Types of Guayule Rubber

The types of guayule rubber studied and the kind of rubber used as a standard are shown in Table 1. Some of the rubbers have been produced commercially; while others have only reached the pilot plant or laboratory stage. The samples compared in this report are not the best that have been produced by the various methods, but are believed to be representative of production or research to date. For convenience, a symbol and an abbreviated name have been assigned to each rubber. The abbreviations are used in the text, and the symbols are used in the charts and one table in preference to the longer abbreviated names.

TABLE 1. STANDARD FOR COMPARISON AND TYPES OF GUAYULE RUBBER USED

	Symbol	Abbreviated Names
Hevea smoked sheet from Honduras...	SS	Smoked sheet
Latex guayule rubber from three-year cultivated shrub	LG	Latex guayule
Alkali-alcohol treated guayule rubber from mature Mexican wild shrub....	DG	Deresinated guayule
Guayule rubber from retted three-year cultivated shrub	RG	Retted guayule
Resinous guayule rubber from 12-year cultivated shrub	OG	Old guayule
Resinous guayule rubber from mature Texas wild shrub.....	TG	Texas guayule
Resinous guayule rubber from three-year cultivated shrub	YG	Young guayule
Resinous guayule rubber from mature Mexican wild shrub.....	MG	Mexican guayule

[1] In charge of physical testing at pilot plant for investigations on guayule rubber, Salinas, Calif., Bureau of Agricultural & Industries Chemistry, Agriculture Research Administration. (Guayule Emergency Rubber Project at United States Department of Agriculture.)
[2] In charge of chemical control and research at above.

Deresinated guayule and Mexican guayule were obtained from the Rubber Reserve Co. Deresinated guayule is the product of the Continental Mexican Rubber Co. from its factory at Torreon, Mexico, and is obtained from Mexican guayule by an alkali-alcohol extraction which removes much of the non-rubber hydrocarbon material present in this pebble milled product. To date it is believed that the production of deresinated guayule by this process is still in an experimental stage. Old guayule and Texas guayule have been produced commercially in Salinas by the Guayule Emergency Rubber Project and are very similar in composition and properties. Young guayule and possibly retted guayule will be commercial products of the Emergency Rubber Project mills, which will start production early in 1945 (new mill at Bakersfield, Calif., reconditioned mill at Salinas). Retted guayule is produced from the same type of shrub as young guayule, but differs from young guayule in that the cut shrub is first submitted to a microbial action to reduce the resin content of the final product (retting process) (8-9). Latex guayule has been produced only on a laboratory scale thus far, and experimentation is now entering the pilot-plant stage. Latex guayule has the distinction of being the only guayule rubber extracted from the shrub in an uncoagulated state. The rubber is prepared by extracting the latex from the cut shrub, clarifying, concentrating, coagulating the dispersion, and drying the final rubber (10-11).

While only the resinous grades are produced commercially, any of the above improved grades can be produced if the industry demands guayule of a better quality.

The analyses of the various guayule rubbers and *Hevea* control are shown in Table 2. The rubber hydrocarbon content varies all the way from 91% for deresinated guayule down to 66% for Mexican guayule. In general it could be said that rubbers containing a higher percentage of rubber hydrocarbon will test better. However the state of the hydrocarbon molecule should also be taken into consideration.

TABLE 2. ANALYSES OF *Hevea* AND GUAYULE RUBBERS

	SS	LG	DG	RG	OG	TG	YG	MG
Rubber hydrocarbon-% ...	93.0	85.5	90.8	78.0	73.2	73.0	69.2	66.0
Acetone solubles-%	4.0	13.5	6.8	12.9	18.4	18.7	22.0	22.1
Acetone-benzene insolubles-%	..	1.0	2.4	9.1	8.4	8.3	8.8	11.9
Protein-%	3.0	..	..	..	..	..	..	..

Formula

The basic formula selected for the compounding tests is the modified A.C.S. formula developed for rubbers low in fatty acid content (12) except that one part of Captax is used instead of one-half part in order to increase the curing rate. The amounts of carbon black used at the different loadings are indicated. The formula is given below:

Rubber	100.0
Mercaptobenzothiazole	1.0
Stearic acid	4.0
Zinc oxide	6.0
Sulphur	3.5
Medium processing channel black 0, 20, 30, 40, 50, 60	

It should be pointed out that old guayule and Texas guayule contained approximately 0.4% of a primary aromatic amine,[4] which has a considerable activating effect on cure. This antioxidant was added at the factory before drying the rubber.

All stocks were mixed on a 6- by 12-inch laboratory mill having a ratio of speeds of backroll to front roll of 1.4 to 1. The milling temperature for all guayule stocks except latex guayule

[3] Bibliography references appear at end of this article.
[4] 4.4 diamino diphenyl methane.

TABLE 3. TENSILE PROPERTIES OF GUM STOCKS

	Tensile Strength (P.S.I.) Curing Time (Minutes)				Modulus at 600% E. (P.S.I.) Curing Time (Minutes)				% Ultimate Elongation Curing Time (Minutes)			
	30	60	90	120	30	60	90	120	30	60	90	120
Smoked sheet	2500	3300	*3620*	3540	630	1400	1990	2180	800	730	700	680
Latex guayule	3010	*3280*	3150	2850	1150	1680	1720	1300	810	800	760	740
Deresinated guayule	2400	3050	*3230*	3140	450	930	920	820	820	810	780	760
Retted guayule	1900	*2610*	2480	2450	600	1190	1200	1120	790	750	740	730
Old guayule	2350	*2580*	2500	2350	830	1100	1110	980	760	730	720	700
Texas guayule	2180	*2390*	2370	2310	790	1020	990	950	770	740	730	700
Young guayule	2270	*2350*	2320	2090	740	1030	1020	980	790	730	730	710
Mexican guayule	1590	1770	*1820*	1760	280	560	600	570	860	780	760	750

was kept at 50° C. It was found that latex guayule would mill satisfactorily at 70° C., the same as for the control. Otherwise all mixing operations were performed strictly in accordance with the standard methods of A.S.T.M. (13).

Curing

All stocks were cured for 30, 60, 90, and 120 minutes at 127° C., and most of the tests were performed at these four cures. For the sake of simplicity in making comparisons, only the results obtained at optimum cure are reported. For this study the time of cure for each stock that gave optimum tensile strength was selected as the optimum cure. Although the ¼-inch-thick abrasion specimens, the ½-inch-thick compression set specimens, and the one-inch-thick rebound specimens are all thicker than the 0.075-inch tensile specimens, no additional curing time was given these specimens. The thicker specimens were admittedly somewhat undercured, with respect to tensile strength; however it is believed that this does not invalidate the comparative value of the results obtained.

The tensile properties of the gum stocks at all cures are shown in Table 3. The highest tensile strength is italicized in each case. It was found that addition of carbon black did not materially affect the curing rate of the basic formula.

It will be noted in Table 3 that the general tendency was for all guayule stocks except deresinated guayule and Mexican guayule to cure faster than the control. If modulus had been used in lieu of tensile strength as a criterion of optimum cure, the optimum cures of deresinated guayule and Mexican guayule would have been at 60 minutes. This would have given somewhat less favorable results for permanent set and compression set.

There is a greater tendency for the latex guayule stock to revert than for any other stock tested. This is shown by the fact that the modulus of the latex guayule drops from 1,720 p.s.i. for the 90-minute cure to 1,300 p.s.i. for the 120-minute cure.

Program of Tests

The following program of tests was selected as being of interest in comparing the different types of guayule rubbers:

TESTS ON UNCOMPOUNDED SAMPLES
1. Plasticity and Recovery at 100° C.
2. Breakdown Time on Milling.

TESTS ON VULCANIZED STOCKS
1. Shore Hardness.
2. Tensile Strength.
3. Ultimate Elongation.
4. Modulus at 400% Elongation.
5. Permanent Set at 75% Ultimate Elongation.
6. Rebound.
7. Abrasion Resistance.
8. Compression Set at Constant Deflection.
9. T-50 Test.

Results of Tests

Plastic Properties

The plastic properties of the different guayule rubbers tested are shown in Table 4. Breakdown time was the time required to form a smooth, glassy sheet on the compounding mill, at which time addition of compounding ingredients was started. The values given represent the average of six runs. This property is fairly consistent for a given type of rubber.

TABLE 4. PLASTIC PROPERTIES OF GUAYULE RUBBERS

	Breakdown Time Minutes	Plasticity No. 0.0001-Inch Units	Recovery No. 0.0001-Inch Units
Smoked sheet	4*	225	278
Latex guayule	2½*	159	194
Deresinated guayule	3½	143	175
Retted guayule	2	150	173
Old guayule	2¾	154	199
Texas guayule	2½	148	181
Young guayule	1¾	100	111
Mexican guayule	2	102	108

* Milled at 70° C.

The plasticity was measured with a conventional Williams plastometer in which the upper platen has a weight of five kilograms. The entire apparatus is placed in an oven kept at 100° C. After a fifteen-minute warm-up period the upper platen is released on to the two-cubic centimeter cylindrical pellet. The thickness of the specimen after three minutes is called the plasticity number and is a measure of the stiffness or toughness of the sample. The thickness of the sample after a 15-minute recovery is called the recovery number.

The smoked sheet was less plastic than any of the guayule rubbers. In general the plasticity tends to increase (lower plasticity number, recovery number, and shorter breakdown time) with increase in resin content. Old guayule, Texas guayule, retted guayule, and latex guayule, however, are exceptions. Old guayule and Texas guayule contain a primary aromatic amine which is known to have a stiffening effect. The retted guayule contains a higher percentage of acetone-benzene insolubles than deresinated guayule which accounts for the higher plasticity number of retted guayule, and latex guayule probably has a higher molecular weight than any of the other guayule rubbers, which may tend to make it less plastic. The supposition that latex guayule has a higher molecular weight than the other guayule rubbers has been indicated by viscosity measuerments (14).

All the guayule rubbers except young guayule and Mexican guayule mixed on the mill easier and in less time than the smoked sheet, with the ease of compounding proportional to the initial plasticity of the crude. Young guayule and Mexican guayule were too soft and sticky to compound well, and invariably the rubber left the front roll and went to the back roll before all of the carbon black had been added. All of the guayule rubbers wetted and dispersed the carbon black much more readily than did smoked sheet.

Shore Hardness

The Shore hardness values of the vulcanized stocks are shown in Figure 1. The hardness measurements were made on tensile specimens piled to a thickness of 0.3-inch.

All stocks increased in hardness with increasing carbon black content. There was not a great deal of difference in the hardness of the stocks at a given carbon black loading. However smoked sheet, retted guayule, and deresinated guayule were the hardest at all loadings, and young guayule, Mexican guayule, and latex guayule were the softest.

Tensile Properties

The tensile properties: namely, tensile strength, ultimate elongation, modulus at 400% elongation, and permanent set are charted in Figures 2, 3, 4, and 5, respectively.

The tensile strength of smoked sheet is the highest of the rubbers tested at all loadings of carbon black except at 20 parts of carbon black where it is slightly surpassed by latex guayule. Latex guayule has the highest tensile strength of the guayule rubbers, followed by deresinated guayule, retted guayule, old guayule, Texas guayule, young guayule, and Mexican guayule, with old guayule, Texas guayule, and young guayule being equal. The difference between latex guayule and deresinated guayule disappears at the higher loadings of carbon black. Smoked sheet and deresinated guayule pass through a peak at 30 parts of carbon black, and latex guayule and retted guayule pass through a peak at 20 parts of carbon black. It is significant that channel black does not appreciably reenforce old guayule, Texas guayule, young guayule, and Mexican guayule with respect to tensile strength. At a loading of 50 parts of carbon black, latex guayule and deresinated guayule have a tensile strength 86% as high as that of smoked sheet.

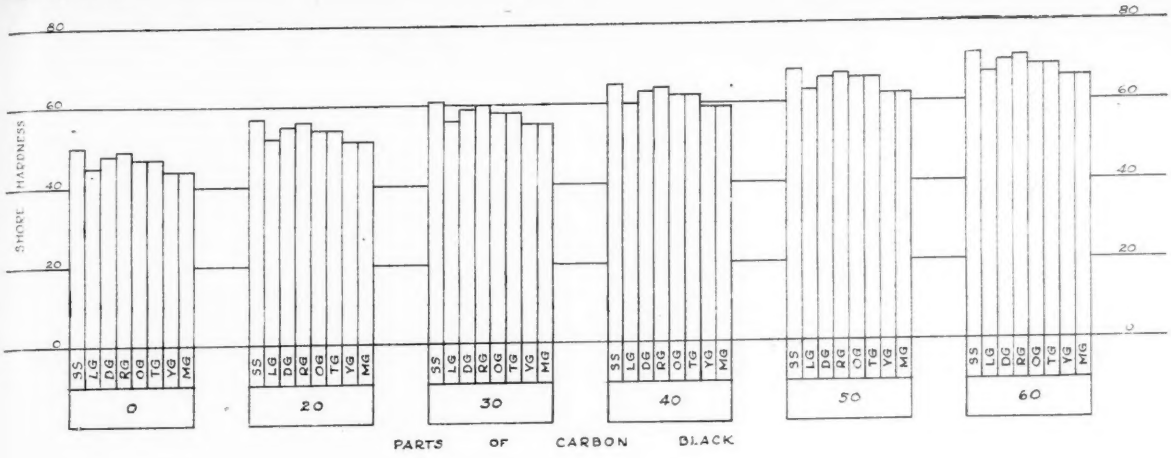


Fig. 1. Shore Hardness

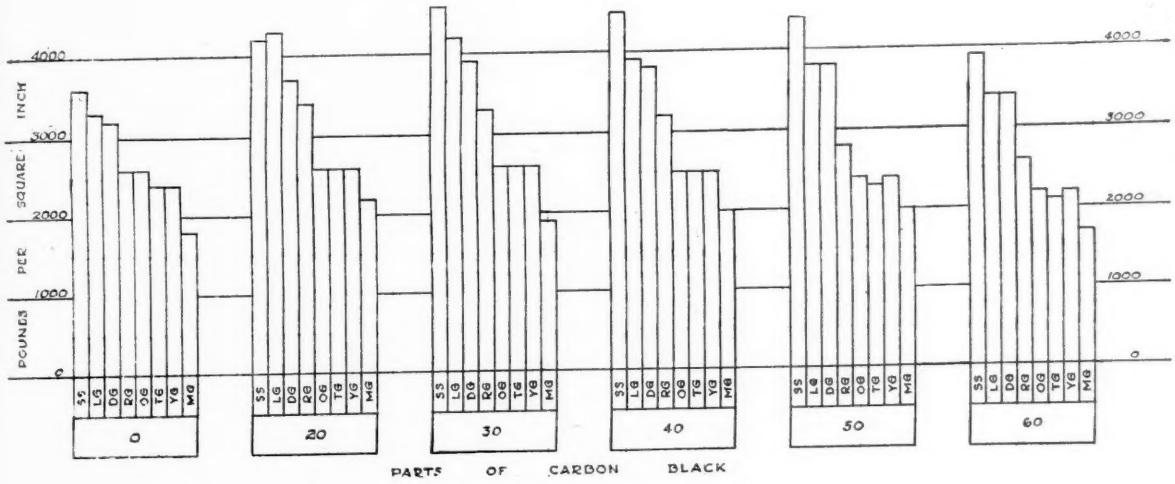


Fig. 2. Tensile Strength

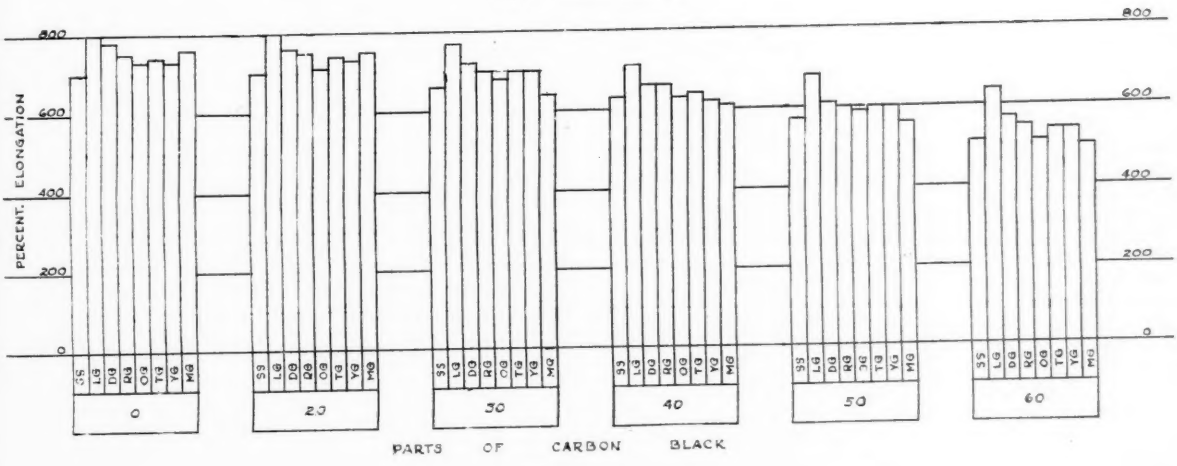


Fig. 3. Ultimate Elongation

The ultimate elongations of all stocks decrease with increasing carbon black content. Latex guayule has the highest elongation at break of all the rubbers at all loadings of carbon black; while smoked sheet and old guayule have comparatively low elongation. Mexican guayule has a medium elongation at 0 and 20 parts of carbon black and a low elongation at 30 parts or more of carbon black. The elongations of the other rubbers are about equal and in between latex guayule and smoked sheet.

The moduli at 400% increase with increasing carbon black content for all stocks. Smoked sheet has the highest modulus of any of the rubbers at all loadings and, therefore, has the greatest stiffness of any type. Latex guayule has a comparatively high

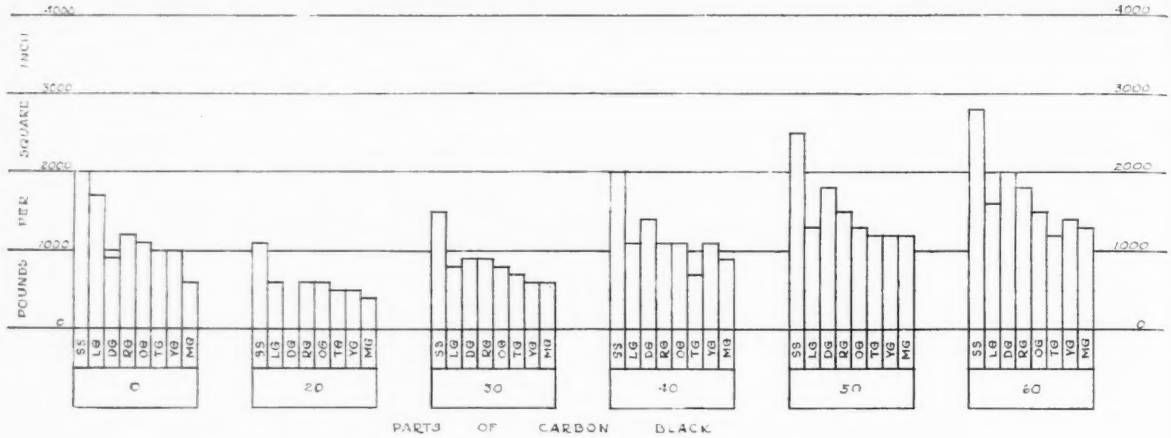


Fig. 4. Modulus at 400% Elongation (600% Elongation in Cases of O Parts of Carbon Black)

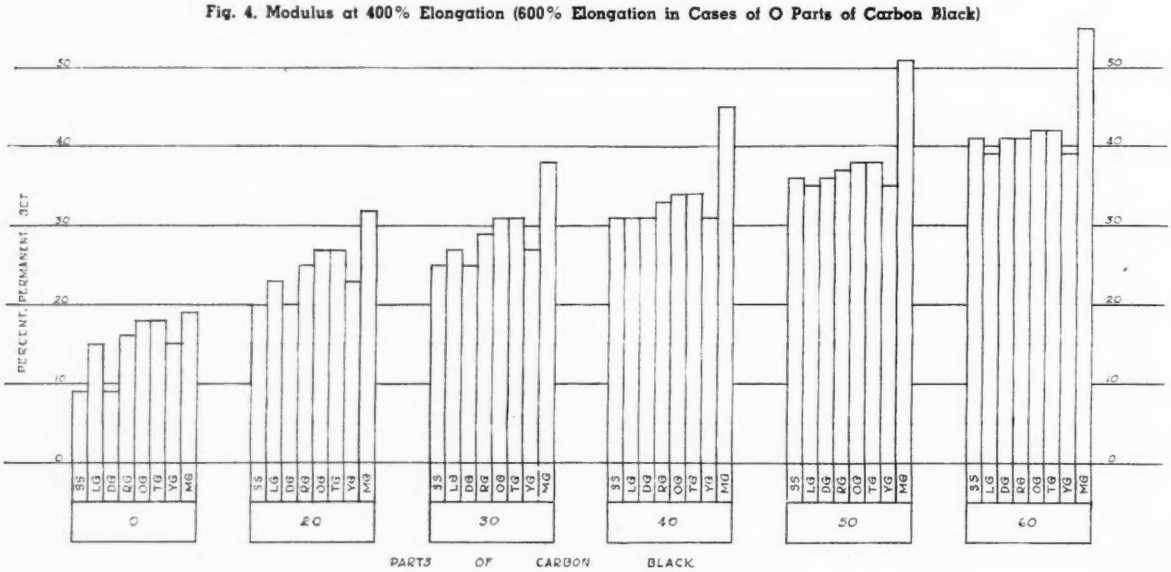


Fig. 5. Permanent Set at 75% Ultimate Elongation

modulus at the lower loadings of carbon black, but is surpassed by deresinated guayule and retted guayule at the higher loadings. Mexican guayule tends to have a low modulus, particularly at the lower loadings. The moduli of the other rubbers are about equal at most loadings.

The permanent set measurements were made at 75% of the ultimate elongation in accordance with the standard method of the A.S.T.M. (15). The permanent set of all stocks increased greatly with carbon black content. Mexican guayule had by far the highest permanent set at all loadings. With the exception of Mexican guayule, increasing the carbon black content tended to neutralize differences in permanent set. At a loading of 40 parts of carbon black, smoked sheet, latex guayule, deresinated guayule, and young guayule all had the same permanent set value. Below 40 parts of carbon black, smoked sheet, and deresinated guayule had the lowest permanent sets; while, above 40 parts of carbon black, latex guayule and young guayule had the lowest values. Retted guayule, old guayule, and Texas guayule had higher permanent sets than did smoked sheet, latex guayule, deresinated guayule, and young guayule, particularly at the lower loadings.

It should be noted here that the permanent set of 15% for latex guayule on the gum formula is over the normal set obtained for this rubber, which runs between 9% and 12%.

Rebound

Rebound or resilience was measured with the Goodyear-Healy rebound pendulum at 75° F. An angle of drop of 15 degrees and a test piece, one inch by one inch by two inches, were utilized. The data are charted in Figure 6. The rebound for all stocks decreased greatly with increasing carbon black content. Smoked sheet had the highest rebound at all loadings of carbon black, but the rebound of latex guayule was equal to that of smoked sheet in the nonloaded stock. Deresinated guayule had a rebound which equaled that of latex guayule at a loading of 60 parts of carbon black, but was not quite so good at the other loadings. Young guayule came next in line to latex guayule and deresinated guayule and had surprisingly good rebound, particularly at the lower loadings. Retted guayule and old guayule were about equal and came next in order to young guayule. Texas guayule and Mexican guayule had the lowest rebounds, with Mexican guayule being slightly poorer than Texas guayule.

Abrasion Resistance

The resistance to abrasion was determined on the National Bureau of Standards abrader according to Method B of the A.S.T.M. (16). The reference standard compound was obtained from The Rubber Manufacturers Association, Inc., New York, N. Y. All results are expressed as percentages of the standard compound. No tests for abrasion resistance were made on the gum stocks. The results are charted in Figure 7. In general the resistance to abrasion increased with increased carbon black content. This increase was most marked with smoked sheet and to

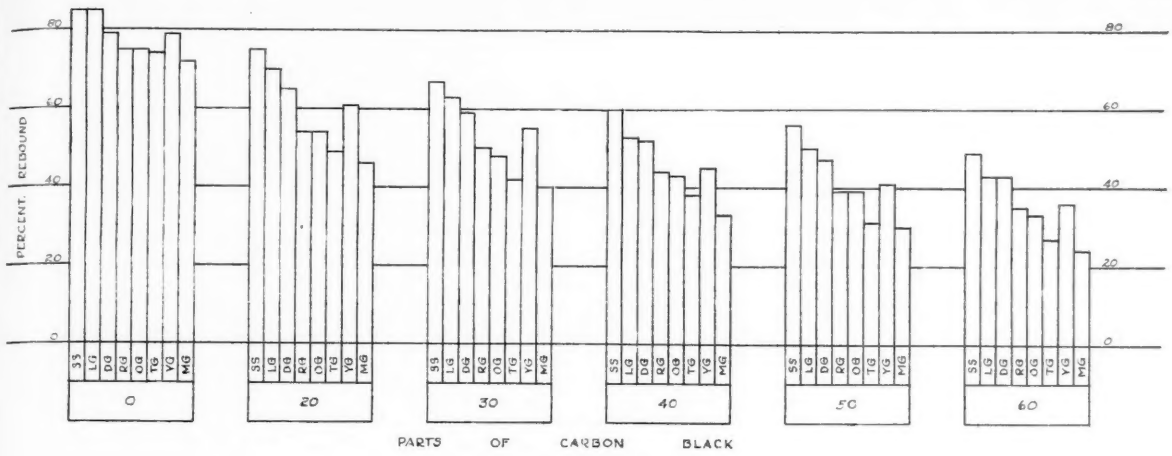


Fig. 6. Goodyear-Healy Rebound

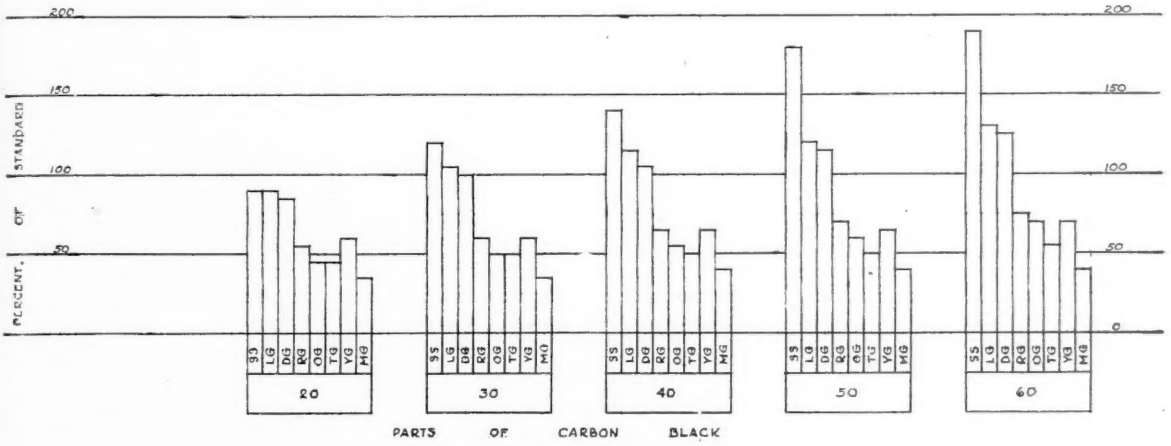


Fig. 7. Resistance to Abrasion

a lesser degree with latex guayule and deresinated guayule. Latex guayule and deresinated guayule were nearly equal at all loadings, with latex guayule being slightly superior. At 20 parts of carbon black latex guayule and deresinated guayule were about equal to smoked sheet; while at 60 parts of carbon black they were only 67% as good as smoked sheet. The abrasion resistance of the other rubbers increased only slightly with increased loadings of carbon black and were much below latex guayule and deresinated guayule. Retted guayule and young guayule had about the same abrasion resistance and were next in order to latex guayule and deresinated guayule. They were followed by old guayule, Texas guayule and Mexican guayule. The abrasion resistance of Mexican guayule was particularly bad, being only 21% as good as smoked sheet at a loading of 60 parts of carbon black.

Compression Set

The results of the compression set tests at constant deflection are given in Figure 8. Method B of the A.S.T.M. was used (17).

It is well known that the curing time for optimum tensile strength is not the same as the curing time for optimum compression set; consequently the values given in Figure 8 are not the best that can be obtained with the respective stocks. Nevertheless these values are considered suitable for the purpose of comparison.

The compression set values for all stocks increase with increasing carbon black content up to 30 parts of carbon black, at which point they begin to level off. Smoked sheet has the lowest compression set at all loadings. Deresinated guayule and latex guayule have the next lowest compression sets at most loadings, with deresinated guayule being somewhat better than latex guayule. Mexican guayule ranks next to latex guayule at most loadings. Retted guayule, old guayule, Texas guayule, and young guayule have the highest compression sets, with young guayule being slightly better than the other three at most loadings.

T-50

The T-50 values were determined by the recommended method A of the A.S.T.M. (18). The T-50 test is usually considered to be a test for the state of cure of a stock, but it is also a very good cold resistance test, since the stock with the lowest T-50 value will have the greatest elasticity at low temperatures. The results are charted in Figure 9.

The T-50 values for all stocks rise with increasing carbon black content. There is considerable difference between rubbers in the gum stocks, but these differences tend to disappear at the higher carbon black loadings. Young guayule has the lowest T-50 value at most loadings, although latex guayule and Mexican guayule have equally low values at a loading of 60 parts of carbon black. Deresinated guayule and old guayule have low T-50 values in the gum stock, but the values become quite high at 60 parts of carbon black. Latex guayule, retted guayule, and Texas guayule have comparatively high T-50 values at the lower loadings, but latex guayule is about equal to young guayule and Mexican guayule at the higher loadings, while retted guayule and Texas guayule remain comparatively high. Smoked sheet has the highest T-50 values at the lower loadings, but becomes about equal to deresinated guayule, retted guayule, old guayule, and Texas guayule at the higher loadings.

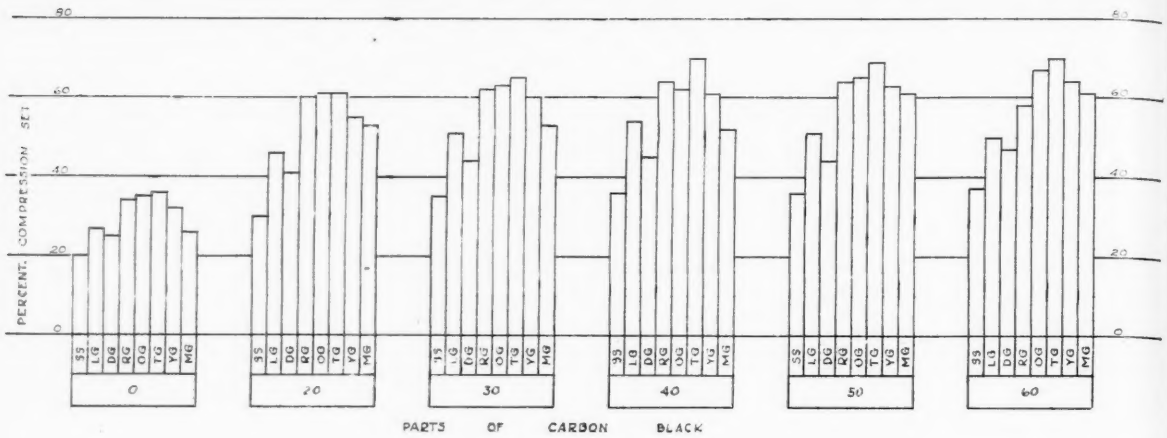


Fig. 8. Compression Set at Constant Deflection

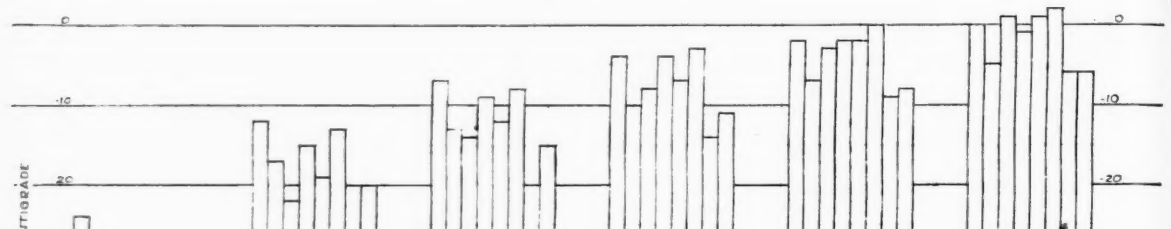


Fig. 9. T-50 Test

Conclusions

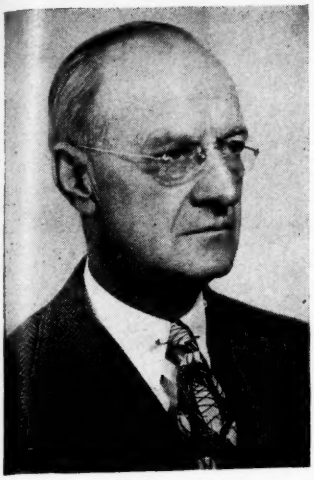
The smoked sheet control is better than any of the guayule rubbers tested, from an overall consideration of properties. Latex guayule and deresinated guayule, although not so good as the control, represent a major improvement over most guayule rubbers and would have a wider application and be used in higher percentage in substitution for *Hevea* smoked sheet. There does not seem to be very much choice between latex guayule and deresinated guayule. This is interesting in view of the fact that deresinated guayule contains 5% more rubber hydrocarbon than latex guayule. Deresinated guayule, incidentally, is of much higher quality than the deresinated guayule rubber used by Morris *et al.* (4) in their compounding studies. Retted guayule shows some improvement over the other resinous rubbers, particularly with respect to tensile strength, although the improvement is not so noticeable in other properties, such as abrasion resistance, for the particular samples tested. There are no outstanding differences between old guayule, Texas guayule, and young guayule; while Mexican guayule is the poorest of the rubbers tested.

Acknowledgments

The authors wish to express their appreciation of the assistance given them in this work by other members of the Guayule Emergency Rubber Project and by Ross E. Morris, Rubber Laboratory, Mare Island Navy Yard, Mare Island, Calif.

Bibliography

(1) The Rubber Manufacturers Association, Inc., "Guayule," June 1, 1942.
(2) Technological paper of the Bureau of Standards, No. 353, Sept. 23, 1927.
(3) *Ind. Eng. Chem.*, 26, 541 (1934).
(4) Morris, James, and Werkenthin, INDIA RUBBER WORLD, 105, 565 (1942); 107, 31 (1942).
(5) Morris, James, Caldwell, and Werkenthin, *Ibid.*, 107, 463 (1943).,
(6) Morris, James, Lew, and Werkenthin, *Ibid.*, 110, 57 (1944).
(7) *Ibid.*, 106, 447, 568 (1942); 107, 37 (1943).
(8) D. Spence, U. S. patent No. 1,918,671.
(9) "Improvement of Guayule Rubber by Shrub Retting." J. W. White, Jr., J. Naghski, Paul J. Allen, Sam R. Hoover, and J. J. Willaman. Natural Rubber from Domestic Sources, Paper No. 5 (1944); INDIA RUBBER WORLD, 111, 570-573 (1945).
(10) D. Spence, U. S. patent No. 2,119,030.
(11) Unpublished progress report on latex investigation by Bureau of Agricultural & Industrial Chemistry, U. S. Department of Agriculture.
(12) Sackett, INDIA RUBBER WORLD, 110, 295 (1944).
(13) Standard Methods of Sample Preparation for Physical Testing of Rubber Products; A.S.T.M. Designation: D15-41.
(14) Unpublished progress report on viscosity measurements by Bureau of Agricultural & Industrial Chemistry, U. S. Department of Agriculture.
(15) Standard Methods of Tension Testing of Vulcanized Rubber; A.S.T.M. Designation: D412-41.
(16) Standard Methods of Test for Abrasion Resistance of Rubber Compounds; A.S.T.M. Designation: D394-40.
(17) Tentative Methods of Test for Compression Set of Vulcanized Rubber; A.S.T.M. Designation: D395-40T.
(18) Tentative Methods of Test for Physical State of Cure of Vulcanized Rubber; A.S.T.M. Designation: D599-40T.



Some Thoughts on the Future of the Rubber Industry

Theron R. Palmer[1]

NEVER in the history of the world has a major industry been forced to find entirely new raw material for its production. If steel, textiles, motors, building, and other major industries had been forced to find new raw materials for their base requirements, what would have happened, especially if this changeover had to be done within weeks or months?

The only parallel is found in the Old Testament in Exodus V, 7th verse, when Pharaoh said to the Task Masters of the people, "Ye shall no more give the people straw to make bricks."

Not only did this condition arise in the rubber industry, but it happened at a time when rubber was vitally needed for the war effort and with production requirements greater than ever before. The production of synthetic rubber in the United States in 1945, however, will equal or exceed the maximum tonnage of crude rubber ever imported into the United States in any given year.

Not only has the rubber industry been forced to find new raw materials, but it has had to find news ways and means of handling these materials and of meeting the rigid specifications and requirements of the Army, Navy, and the Chemical Warfare Service. Every rubber company has had greater problems than it has ever been confronted with before, and the industry can well be proud of the wonderful showing made.

When the war is over, our industry will emerge with executives and workers trained to the highest degree of skill. The problems and difficulties which have been solved have resulted in the training of an army of workers, technicians, and executives with a skill that will be able to meet anything that the postwar period brings forth.

The rubber industry must never again be dependent on outside countries for its raw material, and never again can we permit the countries controlling crude rubber to make restrictions or artificially control the price of that commodity. Crude rubber must be sold at a price regulated by the cost of production and the law of supply and demand. Only under these conditions can we have free and unrestricted use of this material. Some of the leaders of our own industry have in the past favored such restrictions, and the resulting higher prices of rubber because high-priced raw material makes for higher selling prices and lower overhead, but high prices restrict the use of any commodity and stimulate the effort to produce substitutes.

Let us not make the mistake after this war of holding up an umbrella for plastics and synthetics to curtail the production and sale of rubber goods. Synthetic rubber has found a real place in the manufacture of rubber goods and, for many items, will always be used in preference to crude rubber. Possibly some day the ingenuity of man will find ways and means so that synthetic rubber can entirely replace crude rubber and at a price at which crude rubber cannot compete. In any event our government must retain enough synthetic rubber plants to prevent crude rubber prices reaching artificial heights. We do not want to have other countries paying off their war debts in rubber and whiskey.

Our industry will be one of the most favored after the war. It will be several years before production will catch up with demand, and the industry will have time to work out its own reconversion plans. Many new uses for the new rubbers must, and will, be found and exploited by the industry. With the use of synthetic rubber many articles can be made that previously had been unsatisfactory with crude rubber, and a much broader and wider field will be possible for the industry.

When the war is over, government regulations of prices, restrictions, and regulation of commodity uses must cease. War requirements have put labor in the highest income bracket ever reached, and when the government is no longer our chief customer, it will be impossible to pay more money for raw materials and more money for labor by simply marking up this increased cost of production into the prices the government must pay. During the war period the government has set the prices on raw materials and labor and paid the costs as they have increased. We do not want wages to be lowered if they can be maintained, because high wages bring increased demands for our products; but it will be suicidal to continue to pay the present wages without obtaining a greater return from them.

The world is not just one country where all conditions are the same, but it is made up of many countries, the competition from which will determine our selling prices. With most of the countries having low labor and material costs, we must produce more if we expect to be successful in securing world business. Industry has been geared to the point where our home trade is grossly inadequate to provide the necessary jobs to avoid widespread unemployment, and the only remedy will be our ability to sell in foreign markets.

It is a great tribute to the industry that during the war few strikes occurred and comparatively little time has been lost for this reason. It is also a great tribute to labor and management that many difficult problems in this connection have been surmounted. Much can be accomplished in the future if, for the amount received, labor will give its best and if labor and management will both do their utmost to work out the problems that will have to be met. Management must work out improved production methods, and labor must produce to the maximum of its ability if wages are to be maintained at the present level.

High taxes must, and will, continue, and industry and individuals must be taxed to a much greater extent than before the war in order to keep our country solvent, but taxes must not be confiscatory, and profits must not be taxed over and over again. The government must continue to support research and foster development of the country's industries. Management must be vested in industry, and the operation of industry must be kept out of government hands. Proper controls, curbs, and regulations may have to continue for a certain length of time, but we should not make the mistake of allowing the government to take over all industry and destroy competition and incentive. It is this free competition and this freedom of incentive that have made this country the greatest in the world today, and it is the only basis on which we can continue to be the greatest and most prosperous country in the world.

[1] President, Continental Rubber Works, Erie, Pa.

New Synthetic Rubber Fire Hose

A NEW aid in combatting refinery and oil-well fires, a synthetic rubber fire hose said to provide complete resistance to oil, acid fumes, sunlight, mildew, and rot was announced by The Goodyear Tire & Rubber Co., Akron, O. The interior of this Style "M" fire hose is lined with a different type of synthetic rubber than the exterior sheath and is also resistant to deteriorating action. Cotton duck wrapped plies are between the interior synthetic rubber tube and the exterior synthetic rubber cover. These cotton plies are treated with a Goodyear compound which inhibits mildew and rot. The hose is being produced in 1½-, 2-, 2½-, and 3-inch diameters.

EDITORIALS

Another Miracle Necessary

FOR the second time in 3½ years the rubber and associated industries are being called upon to perform a production miracle. In the first instance they were required to design, build, and operate synthetic rubber plants to produce a supply of rubber lost when the Japanese conquered and occupied the Far Eastern plantation areas, and to do this task before the natural rubber stockpile was exhausted. This has been done, but now when the supply of basic raw materials is considerably depleted by ever-increasing war demands, new and very greatly stepped-up demands for 1945 require 50% more truck tires than were produced in 1944, the elimination of an acute shortage of bogie rollers and tank treads, greater production of certain mechanical goods items such as hose and conveyer belting, and more footwear, soles, and heels.

That the magnitude of the present problem has been realized is evidenced by the appointment of John L. Collyer, president of The B. F. Goodrich Co., as Special Director of Rubber Programs and the appointment of J. Edward Trainer, vice president of the Firestone Tire & Rubber Co., as his assistant. Mr. Collyer's powers had not been exactly defined late in March, but it is understood that he has been given wide authority over several phases of production as well as rubber, and that swift expansion of the WPB Rubber Bureau to include top flight executives from the steel, chemical, textile, and other industries in addition to those from the rubber industry would take place immediately as Mr. Collyer began his job of obtaining as quickly as possible the increased production essential to the military success of the Allied Nations.

If it is a miracle that is needed in this case, and a study of some of the figures of requirements for rubber products and their components for 1945 certainly would seem to confirm this belief, the selection of Mr. Collyer with his years of experience in the rubber industry both here and abroad, and of Mr. Trainer with his broad background of experience in production, engineering, and construction, certainly means that if a miracle is required —we will probably see a miracle performed.

Mr. Collyer, in an article in INDIA RUBBER WORLD for February, commented on this problem of how, with the manpower and manufacturing plants obtainable, to build the now-available synthetic rubber into sufficient war goods to meet the enormous requirements of the drive for victory in Europe and in the Pacific, and said at that time: "This problem is no easy one. But its solution depends on hard work and ingenuity, and these are not unfamiliar factors in the rubber industry."

At his first press conference in Washington on March 21, Mr. Collyer emphasized that: "Military success is predicated on uninterrupted war production and transportation in which tires and other rubber products play a major home-front role. The necessity of maintaining essential cars, trucks, and buses on the nation's highways is inseparable from the task of supplying the vital needs of the armed forces."

These statements provide further proof that the vital significance and the wide scope of the problems of the present emergency have been very much on the mind of the new Rubber Director during the past several weeks as he saw new demands being made almost daily, and also indicate his confidence in the ability of the rubber industry to cope with the situation.

The progress of the war in Europe was so increasingly satisfactory during March that by the time these thoughts appear in print, this conflict may have been carried to a victorious conclusion or at least that conclusion may then be a matter of weeks instead of months. Two of the most difficult and at the same time the most important things Mr. Collyer will have to do, as the European phase of the war draws to a close, will be to maintain the conviction in the minds of the entire industry that the stepped-up requirements for military rubber goods are still necessary and to drive home to the general public the importance of tire conservation, at a time when a more plentiful supply of civilian products would appear possible. An advertising and publicity campaign on the latter item is again being organized by the tire industry, but it would also certainly seem wise to give an even more detailed explanation of the reasons for these new demands, which insist on a production of 24,000,000 heavy-duty tires in 1945 and over 30,000,000 of these tires in 1946, than that provided for in the recent year-end report of the WPB Rubber Bureau. This same report, written more than two months ago, indicates a very strong realization of the necessity of adequate explanations to insure maximum effort when it states that:

"The tire program for 1945 calls for tremendous effort on the part of industry, labor, and many government agencies. Close cooperation and mutual understanding of the tasks ahead are essential, if production is to meet or exceed schedules,"

In discussing civilian tire conservation, this report points out that:

"There must be a continuation and an extension of the conservation policies designed to obtain the last mile from every existing tire. This obviously includes a coordinated policy of factual information release and an avoidance of misleading statements as to the availability of tires to the public."

In performing a modern production miracle you must have "teamwork," as Mr. Collyer put it in his previously mentioned Washington press conference. In order to have teamwork you must have the complete confidence of all members of your team, in this case represented by government, the industry, and the public. The record of our war effort provides ample proof that the extra effort required to insure this confidence pays real dividends.

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Scientific and Technical Activities

New A.S.T.M. Standards and Revisions

THE intensive work of Committee D-11 on Rubber and Rubber-Like Materials and its several subcommittees has resulted in five important new standards and revisions to six existing tentative standards, according to the January issue of the *ASTM Bulletin*.

Specifications for GR-S Sheath Compound for Electrical Insulated Cords and Cables (D812-44T). A lower tensile jacket compound is specified in much the same way that Specifications D753 for "Chloroprene Sheath Compound Where Extreme Abrasion Resistance Is Not Required" relates to specifications for "Chloroprene Sheath Compound D752."

Method of Test for Resistance of Vulcanized Rubber and Synthetic Elastomers to Crack Growth (D813-44T). This new method is particularly applicable to tests of synthetic rubber compounds which resist the initiation of cracking due to flexing when tested by Method B of the "A.S.T.M. Dynamic Fatigue Tests for Rubber Products." Cracking initiated in these materials by small cuts or tears in service may rapidly increase in size and progress to complete failure even though the material is extremely resistant to the original flexing-fatigue cracking. Because of this characteristic of synthetic compounds, particularly those of GR-S, this method in which the specimens are first artificially punctured in the flex area should be used in evaluating the fatigue cracking properties of this class of material.

Method of Test for Hydrogen Permeability of Coated Fabrics (D815-44T). This method is intended for use in the determination of the permeability of hydrogen into air through fabrics coated with rubber or synthetic elastomers. The apparatus used is a fabric permeameter.

Method of Test for Permeability of Rubber or Synthetic Elastomers to Volatile Liquids (D814-44T). This method is used to evaluate the permeability of rubber or synthetic elastomers with respect to volatile liquids diffusing into air. It is applicable only to the materials in sheet form of moderate thickness and is principally useful for comparing the relative permeability of different materials to the same liquid or the diffusion of different liquids through the same material. The method is widely used in connection with airplane fuel cells, gasoline hose, and similar applications.

Methods for Testing Rubber Adhesives (D816-44T) These methods are used in testing the properties of adhesives which may be applied in plastic or fluid form and which are manufactured from natural rubber, reclaimed rubber, synthetic elastomers, or combinations of these materials. The methods are not applicable to a particular type of adhesive, or do they include every test applicable to a particular type, but they do provide standard procedures for evaluating the more important properties of the adhesives classed as rubber cements. The tests in one class concerned with the quality of the bond include those for adhesion strength, bonding range, softening point, and cold flow. The tests in the class having to do with the adhesive itself comprise determination of viscosity, stability, cold brittleness, weight per gallon, and plastic deformation (for heavy doughs or putties).

Revision in Standards on Rubber

Added to the tests for changes in properties in rubber materials and liquids (D471) are two additional standard reference fuels for gasoline tests which will meet urgent needs of the automotive and aeronautical industries. Changes in the tests for hard rubber products (D530) involve the method of sample preparation and the procedure for application of the Rockwell hardness test. Since specifications for hydraulic brake hose require a low temperature bend test, a standardized procedure for this property has been added to the test for hydraulic brake hose (D571). In the interest of standardization and to avoid complications in testing sponge rubbers of different apparent densities, the committee is concentrating on the ½-inch slab in the test for cellular rubber products (D552). Changes in the oven test for aging (D573) will eventually provide for a temperature of 100° C. for use with synthetic rubber compounds; the lower temperature now in the methods is entirely too slow with various synthetics. The provisions in the tentative methods for indentation of rubber with the durometer (D676), which methods have been long and intensively discussed, provide for an amplified scope clause giving a better description of the applicability of the method, a temperature of test set up for tests at low temperatures, and the time at which the reading shall be taken. Concerning this latter there have been two fields of thought —whether to use an immediate reading or a delayed reading.

Electrical Insulating Materials

With a large number of specifications and test methods in its charge Committee D-9 on Electrical Insulating Materials is constantly striving to keep the various requirements in line with current practices and current terminology. Revisions in the test for power factor and dielectric constant (D150) are primarily editorial, occasioned by the new term "dielectric dissipation." No changes are involved in the procedure. A dielectric strength test to be made under elongation and revisions in the methods of sampling have been incorporated in the tentative test for varnished cloth and cloth tapes, D295. The modifications for varnished tubing (D372) will permit inclusion of material such as rayon and glass fiber, and in the methods of test for this material (D350) corresponding changes eventually will be incorporated. Now the recommendation sets up modifications as tentative revisions. The term "varnished tubing" hereafter is to be changed to be "treated sleeving." A new flexural test method has been developed which will be incorporated eventually in the standard method of test for sheet and plate materials, D229. Corresponding changes are made in the specifications for varnished cloth tubing, D372.

Plastics

A method for measuring the flow properties of thermoplastic molding materials, D569, is mentioned. There is much interest in flow properties; various changes have been developed, and the committee has asked that the standard be reverted to tentative with the changes incorporated. This test covers a procedure for determining the temperatures at which the material attains a defined degree of flow, or the degree of flow attained when subject to prescribed pressure and temperature.

Because of the need of evaluating some of the softer types of elastomers, changes were needed in the test for resistance to accelerated service conditions, D756. Although there were a number of comments and negative votes on proposed revisions in the standard methods of test for deformation of plastics under load, D621-43, the changes have been approved because of the widespread convictions that the test conditions added are needed. At the same time, the standard is being reverted to the status of tentative. Meanwhile Committee D-20 is giving detailed study to the method.

Dinsmore on Synthetic Plant Use

R. P. DINSMORE, vice president in charge of research and development of The Goodyear Tire & Rubber Co., presented a paper before the Southern California Section of the American Chemical Society on March 9 on "Synthetic Rubber Plants—Postwar." Dr. Dinsmore in his opening remarks commented directly on the shortage of carbon black in the rubber industry, which has caused the abandonment of the seven-day production week in the tire factors, as follows:

"At present we are suffering from a shortage of carbon black so acute as to necessitate a government directive to reduce its use. This is one of the most inexcusable shortages of the war. Its approach has been predicted by the rubber industry for over a year, and it has always been apparent that black manufacture was not in balance with the synthetic rubber capacity. Because of failure of the government to move in time the civilian tire shortage will be more acute and the military tire supply may suffer."

The speaker confined his discussion to GR-S synthetic rubber and the plants used for its production. He pointed out that the GR-S investment is something under 604 million dollars and is divided 57.5% for butadiene, 13.7% for styrene, 27% for copolymers, and the remaining small percentage for miscellaneous chemicals. In dollars, the copolymer investment is $161,-900,000. In Southern California the investment is 75 million dollars for a rubber capacity of 90,000 tons, although actually, it was revealed, only about two-thirds of this capacity has ever been operated.

In discussing the standard GR-S plants with nominal capacities of 30,000 tons of rubber a year, Dr. Dinsmore stated that in everything except reactor capacity the equipment is capable of handling 75% or

so over the nominal rating. Most of them are now being operated about 30% over nominal, and reactor capacity can be balanced with the rest of the equipment by using the continuous process, now being installed in several plants, including one at Torrance, Calif., or by use of activated reaction formulae not yet completely tested. The limitations of the basic features of the copolymer plants which require that these plants employ a process utilizing a water emulsion reaction were outlined, and it is concluded that these limitations would seem to confine the application of surplus copolymer plant equipment to the field of synthetic resins or plastics. Of these, the largest class of plastics to which emulsion polymerization has been applied is that comprising vinyl chloride polymers and copolymers. Although at present this would require only a fraction of the possible excess capacity of the synthetic rubber copolymer plants, it was suggested that if the synthetic resin industry continues its phenomenal growth, it might occupy a respectable fraction of the copolymer plant capacity.

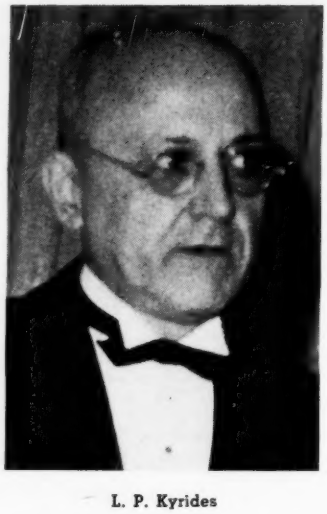
Reviewing the probable requirements for rubber in the years following the recovery of the plantation areas, which was considered as likely to occur some time in the latter half of 1946, it was estimated that crude rubber can be delivered to consumers, in the first four years after plantation recovery at a rate of 400,000, 800,000, 1,100,000, and 1,500,000 tons for each of these succeeding years. Quality and processing difficulties of our present GR-S can be well taken care of by the use of less than 50% crude rubber; hence, in a free market the remaining volume would go to the cheapest rubber, it was added. It is difficult to say to what degree political manipulation might affect this balance either one way or the other, but it is, at least, conceivable that the synthetic requirement for this country may tend to level off at a point between 300,000 and 500,000 tons, Dr. Dinsmore stated.

On the subject of production costs, the butadiene units at Baton Rouge, Baytown, Lake Charles, Port Neches, and Houston were considered to be in a preferred position, with Southern California, Borger, and Toledo next. Synthetic alcohol may yet place Institute and Louisville in a more competitive position. Although there may be the problem of utilizing idle plant capacity, it is unlikely that the government will relinquish any of these plants, at least until the crude rubber shortage has passed and a national policy is determined.

In conclusion, it was stated that this new industry is of respectable magnitude; it is the product of American technical skill and industrial cooperation, and it is a vital factor in our national defense. We should do all we can to preserve and foster it. Its present prospects for a 50% competition with natural rubber seem to him to be good, based on present quality and present most favorable costs, the speaker said.

Fuzon-O

FUZON-O, a line of vinylite resin materials of the dispersion-type, represents a very economical vinylite resin coating warranting consideration for the finishing and manufacturing of many numerous and widely varying products. Formulations have been developed for its use in fabric, cloth, and paper coatings where maximum flexibility is required. It has an extremely high solid content. Stanley Chemical Co., East Berlin, Conn.



L. P. Kyrides

Kyrides Receives Medal

LUCAS P. KYRIDES, director of organic research, Monsanto Chemical Co., St. Louis, Mo., and one of the pioneer workers on synthetic rubber at the Hood Rubber Co. in 1910-13, was the first recipient of the Midwest Award of the St. Louis Section, A.C.S., at a dinner meeting at the Coronado Hotel, St. Louis, March 5. The award, a gold medallion, is to be given annually to the outstanding chemist of the nine midwestern states.

The presentation was made by H. H. Willard, professor of chemistry at the University of Michigan, and other speakers included Harrison Hale, professor of chemistry at the University of Arkansas; C. W. Rodewald, associate professor of chemistry at Washington University and chairman of the St. Louis Section; and C. S. Marvel, A.C.S. president and professor of chemistry at the University of Illinois.

In his address, entitled "The Chemist and the Millennium of Well Being," Dr. Kyrides reviewed the development of organic chemistry from its beginning, with special reference to the growth of the industrial synthetic organic chemical industry in this country. In discussing his work on synthetic rubber, he reported how he and Richard Earle, following a preliminary survey of the problem, abandoned the study of isoprene in favor of butadiene, as it appeared that the latter would be more simple to prepare and the observations made in its synthesis might also be applicable to the rest of this series of hydrocarbons. The problems of the aldol synthesis of butadiene were worked out, but it became apparent in the course of these investigations that the production of the next higher homolog of isoprene, 2,3-dimethylbutadiene, would be cheapest to manufacture. A sufficient quantity of dimethylbutadiene was prepared, polymerized, and supplied to the Hood tire division, but these tires lacked the desired degree of elasticity, were harder, and possessed a leathery characteristic, Dr. Kyrides said. Later it was learned that the Germans had also observed the same characteristics of this rubber, but for military reasons operated a factory for the daily production of ten tons during the war.

The experience gained during the course of ths work made possible the synthesis of isoprene from vinyl methyl ketone through dimethyl vinyl carbinol. During the investigation it was observed that only diolefins which contained two terminal methylene groups polymerized to rubber-like products, the others, such as 1,3-pentadiene, polymerized to oils, Dr. Kyrides declared. All this work had progressed sufficiently, before the declaration of war in Europe in 1914, to convince Kyrides and Earle that it would be possible to commercialize any one of the processes; so recommendation was made that the company discontinue this investigation. At that time aliphatic chemistry was still an orphan, and copolymerization techniques for improving the properties of synthetic rubber had not been considered. It is doubtful that any one company or a combination of companies would have underwritten the present synthetic rubber program in the face of the price threat from the natural product. Since 1942 it was only by pooling all the scientific and industrial resources of this country, supplemented by the know-how from foreign sources, and government subsidies that the project has been made to succeed, the speaker added.

"There is no end to the utility of the products or by-products of research," he declared. "Great as has been the progress in material things, the greatest contribution of synthetic chemistry has been in improving human health and controlling disease. There can be a millennium of well being, and chemists will help to make it possible," said Dr. Kyrides in discussing sulpha drugs and penicillin.

The speaker also expresed concern that America is creating a scientific vacuum, and hence endangering its security, by depleting its available supply of technically trained men. He pointed out that England, having pursued the same course in World War I, is not now making the same mistake twice. Even in the darkest days of Stalingrad, Russian manpower requirements never reached the stage where Russia felt it necessary to call on her scientific men to bear arms, he stated.

Electronic Vulcanization Patents Bought by Goodrich, Firestone

ANNOUNCEMENT was made recently that basic patents covering the electronic vulcanization of rubber and other materials have been purchased by The B. F. Goodrich Co., and the Firestone Tire & Rubber Co., both of Akron, O. The patents were originally granted on discoveries made by R. A. Dufour[1] and H. A. Leduc,[1] of France, and by E. E. W. Kassner, of Switzerland. The two companies stated that the patents would be made available both to the rubber and the plastics industries on a reasonable basis, since it was their opinion that this policy would speed the development of this electronic method and ultimately make available to consumers improved rubber and plastics products at lower costs.

In electronic vulcanization, high-frequency oscillations shake the molecules of rubber and sulphur millions of times a second, creating uniform heat throughout the product being vulcanized in a fraction of the time required when steam is used. The same uniform heating removes difficulties in the molding of thick plastic products. Investigations indicate that the excellent results obtained by electronic vulcanization are due not only to rapid uniform heating, but also may be connected in some way with electronic power itself, which creates qualities not found when present

[1] INDIA RUBBER WORLD, June, 1944, p. 314.

methods of curing are used. There are now enough practical commercial applications of electronic heating developed by Firestone and by Goodrich to justify the use of this process in many more operations, it was said.

Sponge rubber mattresses and pads have been cured by these electronic methods in one-eighth the time needed by conventional processes, and tires, molded rubber goods, brake bands, and many other products can be cured more rapidly by this electronic method, with decided improvements in the products obtained.

John W. Thomas, of Firestone, stated that the process, which has reached the production stage for the first time, is expected to save thousands of manhours and to increase the output of critical war materials 50 to 80%. Use of electronic vulcanization in tank track production is scheduled at the Firestone plant in Noblesville, Ind., while rubber wheels will be turned out at Fall River, Mass. Electronic equipment also will be used at Fall River in curing foamed sponge rubber for mattresses, upholstery, airplane seat cushions, and parachute pads.

It was revealed that foamed sponge rubber, previously cured in 30 minutes by steam, was cured in four minutes by the high-frequency current method. After it is cured the sponge rubber is dried with hot air. It takes 16 hours to dry foamed sponge rubber with hot air alone, but if it is treated electronically for 30 seconds, the drying time is reduced to an hour. Large hard rubber wheels can be cured in 18 minutes as compared to five hours with steam. Brake blocks are cured in seven hours by steam and in 48 minutes by electronic heat. Elastic thread can be cured in 1½ minutes, while 15 minutes are needed if steam is used. It takes 60 minutes to cure tank tracks with steam, but after two minutes of electronic preheating the tracks can be vulcanized by applying steam for only 28 minutes. These are but a few indications of what is being done with electronic heating and what can be done in the future.

In the accompanying illustration is shown electronic heating equipment being used for vulcanizing a small tire in the Firestone electronics laboratory. The high-frequency current flows back and forth through the aluminum plates connected to the generator and the rubber product placed between those plates 10 to 100 million times each second. The electronics engineer operating the controls is Fred H. Mason, and his assistant is Miss Jeanne Ormsby.

Vulcanizing a Small Tire by Electronic Heating

Philadelphia Rubber Group's First Meeting

THE first meeting of the newly organized Philadelphia Rubber Group was held at the Benjamin Franklin Hotel in Philadelphia on March 9 with 228 persons present for dinner and the program that followed. Temporary Chairman R. S. Hanslick welcomed the new members, totaling 191, and explained the details of the formation of the new organization. The speaker of the evening was A. A. Somerville, of R. T. Vanderbilt Co., who discussed "Getting Technical Work Done." Entertainment in the form of a demonstration of magic and mind reading was enjoyed following dinner and before Dr. Somerville's talk.

In his opening remarks the speaker referred to the fact that the Division of Rubber Chemistry of the American Chemical Society also had been organized in Philadelphia in 1919 and then explained that his talk would consist mostly of personal observations of the past thirty or more years on how best to accomplish the technical work required to insure progress in the rubber industry. He concluded by mentioning some of the specific and general problems now requiring solution. Dr. Somerville emphasized the necessity of teamwork in research investigations and the value of brevity in the written and spoken word. He decried the lack of originality in some technical work and said that he felt that better results will be obtained later when there is less government regulation such as now seems necessary, but at the same time hampers efforts to get technical work done.

As a specific problem in rubber manufacturing, the necessity of "cleaning-up" the mill room was stressed. It was admitted that progress had been made with the handling of carbon black by use of the dustless type, and the introduction of this ingredient into the latex at the synthetic rubber plants was hailed as an even greater advance in the progress toward cleaner and more efficient millrooms. As a further contribution, Dr. Somerville exhibited a sample of a "pelletized" copper-type accelerator which his company had worked out to eliminate the dust problem in laboratory or factory millrooms.

Chairman Hanslick in his remarks mentioned that in the formation of a new organization such as the Philadelphia Rubber Group it is necessary to obtain sponsors to help with the initial expenses and provided a backing for the necessary arrangements could be made for the activities of the Group. He expressed his appreciation for the assistance obtained from many companies in the rubber and associated industries who had consented to act as sponsors for the new organization. A list of these companies follows: The West Co., Philadelphia, Pa.; Hamilton Laboratories, Hamilton Square, N. J.; Associated Rubber Products Co., Irvington, N. J.; E. I. du Pont de Nemours & Co., Inc., and Hercules Powder Co., both of Wilmington, Del.; L. Albert & Son, Trenton, N. J.; Vulcanized Rubber Co., New York, N. Y.; Sharples Chemical Co., Philadelphia, Pa.; Monsanto Chemical Co., Akron, O.; Wilmington Chemical Corp., New York; Lee Rubber & Tire Corp., Conshohocken, Pa.; H. N. Richards Co. and H. M. Royal, Inc., both of Trenton; A. P. deSanno & Son, Phoenixville, Pa.; B. F. Goodrich Co., Oaks, Pa.; MacEwan & Smith Co., Doylestown, Pa.; Thiokol Corp., Trenton; Bloomingdale Rubber Co., Chester, Pa.; Electric Hose & Rubber Co., Wilmington, Del.; Quaker Rubber Corp. and L. H. Gilmer Co., both of Philadelphia.

It was also announced that the next meeting of the Group would probably be held the first week in June. At this meeting a nominating committee will be appointed, and election of permanent officers of the Group for a year will be held at a third meeting.

Mark Addresses Ontario Group

J. G. MARK, of Dewey & Almy Chemical Co., Cambridge, Mass., spoke at the March 13 meeting of the Ontario Rubber Section, which was preceded by a dinner held jointly with other chemical groups in the Toronto area under the auspices of the Chemical Institute of Canada. Present at this dinner in the Royal York Hotel, Toronto, were 244 persons.

At the meeting of the Ontario Rubber Section, which 60 members and guests attended, the chairman, H. G. Deline, explained that although the question of financing subject groups by the Institute was probable, definite arrangements could be made once the basic policy was settled.

Dr. Mark, introduced by H. C. Pearson, general manager of Dewey & Almy Chemical Co. of Canada, Ltd., LaSalle, P. Q., reviewed the history of plastics and elastomers through celluloid and vinyl resin to Bakelite, ethyl cellulose, and urea formaldehyde. From 1879 to 1884 the first rubber-like polymer was made from isoprene, he said. In 1910 it was learned that sodium was a catalyst for dimethylbutadiene. In 1912 the emulsion polymerization of butadiene was introduced.

"Today," he continued, "we are tailor making polymers to suit our needs."

We have taken proteins, carbohydrates, and hydrocarbons and have modified them

(*Continued on Page* 84)

UNITED STATES

Collyer Special Rubber Director; Progress Report Stresses Critical Tire Situation

Developments followed one another at a rapid rate during March, and the increasingly critical shortages of component materials for rubber goods production resulted in the formation of a special inter-agency committee headed by Michael Deutch, of WPB, to expedite increased carbon black production, a Congressional investigation by the Mead Committee into carbon black and tire production, and finally the appointment on March 21 of John L. Collyer, president of The B. F. Goodrich Co., as Special Rubber Director for a period of three months to bring the production of these components into balance with synthetic rubber production and tire and other rubber goods manufacturing capacity. An increase of 46% in the production of truck tires during the three months ended February 28 was called a "truly remarkable accomplishment" by H. G. Batcheller, chief of operations for the WPB, but this "tremendous rate of tire production" practically exhausted the inventory of carbon black; so the WPB and the War Department on March 7 temporarily released the tire industry and tire workers of the pledge of seven-day-a-week operations.

Rubber Reserve Co. announced that synthetic rubber production scheduled for 1945 totaled 1,000,000 tons and for 1946, about 1,200,000 tons, and WPB Chairman J. A. Krug released revised figures for scheduled production of tires for the second quarter of 1945, showing reductions from November, 1944, estimates because of the shortage of carbon black. A year-end report of the WPB Rubber Bureau emphasized that in addition to more carbon black, the production of rayon and cotton tire cord, beadwire, and two or three chemicals would have to be increased if the production goals for tires and tubes and other rubber products are to be realized. James F. Clark, whose resignation as head of the Rubber Bureau has been pending for several weeks, will remain as long as necessary to cooperate with Mr. Collyer and then return to private business. The total DPC authorizations for new truck tire facilities now total 39, and new and additional authorizations for carbon black facilities now total 23.

Tire Production Developments

Mr. Batcheller on March 3 released figures on the January, 1945, production of tires of several types and paid tribute to the "superhuman effort" by men and management in the tire industry to supply the increasing demands of the European front. He stated that 1,770,000 vitally-needed truck and bus tires (A-1 through A-6) had been turned out in January, against 1,217,000 such tires produced in October, 1944. January airplane tire production was 110,200, an 8% improvement over October, 1944, and 227,000 tractor-implement tires were produced, 29% more than in the same base period. Production of passenger-car and motorcycle tires for January totaled 2,013,000, 62,000 less than in October, 1944; and only 5,000,000 of these tires will be produced during the first quarter of 1945 because of a shortage of cotton cord, it was stated in this announcement.

The tremendous rate of tire production has practically exhausted the inventory of carbon black, and the inventory of tire cord stocks has dropped to dangerously low levels, Mr. Batcheller said. He warned of possibility of abandoning the seven-day production week in the heavy-duty tire plants until the supply of carbon black could catch up with the accelerated production rate of the industry and the tire workers.

In a joint WPB-War Department statement on March 7 the tire industry and tire workers were released from their pledge of seven-day week operations, and Sunday, March 11, the tire plants suspended operations for the first time since January 15. A telegram to tire companies and the union explained that the greatly accelerated rate of tire production had temporarily outstripped the available supply of carbon black and other tire components, and to avoid intermittent disruption in plant operations and work schedules the tire industry and its workers were released from their pledge of seven-day week operations for March. It was emphasized that no effort was being spared to eliminate these shortages in order that the seven-day week might be resumed as soon as possible since the utmost in tire output was necessary to meet the extremely urgent requirements of military operations now proceeding at top speed on all fronts.

The RFC on March 12 reported that 1944 synthetic rubber production in the United States totaled 763,255 long tons and stated that the production scheduled for 1945 is about 1,000,000 long tons and for 1946 about 1,200,000 long tons. Largest world consumption for any prewar year was 1,108,000 long tons of natural rubber in 1939. Rubber Reserve reported that these 1945 and 1946 production goals can be reached provided: (1) adequate supplies of petroleum, alcohol, and chemicals are made available; (2) plant additions and improvements representing approximately 3% of the initial cost of the plants are made; (3) a sufficient body of technically trained and skilled men is made available to operate the plants at these higher rates of production. About 22,000 workers are currently engaged in the government program.

Col. J. Monroe Johnson, ODT director, on March 9 warned truck and bus operators that since only 50% of the 2,781,000 truck and bus tires requested for the second quarter of 1945 had been allocated by the WPB, there was no cause for optimism about any improvement or easement in the availability of heavy-duty tires compared with commercial motor vehicle needs.

The Carbon Black Shortage

The warning by Mr. Batcheller on March 3, mentioned previously, that the carbon black supply was lagging behind requirements of tire production was developed further by Charles C. Miller, writing from Washington for *The Akron Beacon Journal* of March 4, and the Senate Committee under James M. Mead started a preliminary investigation on March 6 to determine who was responsible for this shortage which was going to reduce the output of military tires. A committee representative said it was decided to conduct a staff inquiry into the matter, and if the facts warranted, a full investigation would be made.

Meanwhile the United Rubber Workers in Akron took, on March 7, separate action in that the union executive board authorized Sherman Dalrymple, its president, to make an investigation of the shortages of carbon black, tire fabric, and other materials in order to be able to report to their members why it was impossible to continue the all-out production drive.

On March 10, when it became definitely known that production in most of the tire plants would be suspended on Sunday, March 11, for the first time since January 15, it was announced that War Mobilization Director James F. Byrnes had authorized the formation at once of an inter-agency committee to include representatives of the WPB, War and Navy departments, OPA, WMC, and Petroleum Administration for War, with "full authority to act to remove bottlenecks which stand in the way of increased production." Michael Deutch, of WPB, was appointed chairman of this committee. During the week of March 11 it was announced from Akron that despite the continued shortage of carbon black, the Akron plants only of Goodyear, Goodrich, Firestone, General Tire, and Seiberling at Barberton, would resume Sunday work on March 18 in departments where big tires are built, by curtailing production of smaller sizes and using all available carbon black in stock for critical items. It was stated that tire company officials were unable to forecast at that time whether Sunday operations would be possible on March 25.

On March 17 an eight-point program to increase carbon black production was reported, as a result of the work of the Byrnes inter-agency committee, by Mr. Miller in *The Akron Beacon Journal*. Requirements for 1945 were placed at 1,255,000,000 pounds. Emergency production measures will raise output to 85,000,000 pounds a month by April and to 98,000,000 pounds a month by July, it was said. To reach these quotas the inter-agency has approved the following measures: (1) The PAW will provide 10,000 barrels of napintha and 2,000 barrels of natural gasoline residue a day to increase carbon black production by 1,500,000 pounds a month. It will take six weeks to two months to accomplish this. (2) PAW will release 115,000 gallons of propane gas a day immediately to step up carbon black output by 1,000,000 pounds a month. (3) PAW will release, as soon as the present heating season is past, about six weeks from now, an additional 50,000 gallons of propane daily. It is estimated that this would add nearly 500,000 pounds of carbon black a month. (4) The Texas Railroad Commission is granting an emergency 30-day waiver on the use of sweet gas at several Texas plants to bring in an additional 1,500,000 pounds of channel black immediately. (5) The industry and the government are working out at once means of enriching gas at several furnace plants to step up their present production by 40%. (6) The inter-agency committee is seeking in further discussion the immediate reduction of carbon black exports. (7) The WMC has instructed its regional and area offices to give the carbon black industry immediate manpower aid and has placed the highest priority on labor for that industry. (8) The Defense Supplies Corp. is working out plans to expedite the construction of new carbon black plants.

In connection with the last item DSC on March 15 announced an increase in the

preliminary commitment to Godfrey L. Cabot, Inc., to $1,500,000 for plant facilities at Guymon, Okla., the estimated cost of which will approximate $3,000,000, and on March 17, a preliminary commitment of $1,500,000 to Columbian Carbon Co. to provide for the acquisition of plant facilities at Seagraves, Tex., the estimated cost of which will be about $2,250,000. A preliminary commitment of $5,000,000 to United Carbon Co. to provide for plant facilities at Odessa, Tex., the total cost of which will approximate $7,000,000, and a preliminary commitment of $1,000,000 to Charles Eneu Johnson & Co. to provide plant facilities at Eunice, N. Mex., the estimated total cost of which will be about $3,000,000, were also made public at the same time.

Carbon Black Industry Comments

In the September, 1944, issue of INDIA RUBBER WORLD on page 654 was published a memorandum to the rubber industry signed by Thomas J. Starkie, who was then chief, Pigment and Color Section, WPB, which gave figures on past, present, and possible future production of both channel- and furnace-type carbon blacks at that time. Since this memorandum predicted a production rate of 1,200,000,000 pounds of both types of black by March 1, 1945, an attempt was made by interviewing leading carbon black manufacturers to determine why this rate had not been realized and to get their opinion as to the probable chances of success of the inter-agency committee program to increase production to the desired figure.

The general consensus of opinion seemed to be that while there is nothing much to be gained in trying to place the blame for the present situation, it was due to bad guessing and red tape on the part of the several government agencies involved. The carbon black industry had recommended stockpiling and rehabilitation of production facilities since October, 1942, and expansion of production facilities since the middle of 1943, but it was not until the Spring of 1944 that the WPB called on the industry to increase carbon black output and offered to provide the necessary funds through DPC.

During the Spring of 1944, when the production of synthetic rubber actually began to exceed all goals which had been set, it became evident that carbon black consumption had to be increased, but another difficulty that delayed expansion of facilities was the refusal of OPA to increase the ceiling price of channel black, even though the cost of the gas for additional production would be 3½ to 4¢ per thousand cubic feet, as compared with the 1¼¢ cost of the gas for the established plants. OPA said if producers wanted an increase in the ceiling price of carbon black, they should provide cost data for the past several years; then OPA would consider the matter. The producers stated that they were not seeking an increase in the ceiling price of channel black already being produced, only for that from any new production from higher cost gas. A general agreement was apparently reached with OPA in October, 1944, and on March 19, 1945, an adjustable pricing order was issued by OPA (Order 49 under Section 1499.19a of GMPR) covering sales of rubber grades of channel carbon black to DSC. It was stated that this order precedes issuance of new pricing provisions that will grant higher than normal ceilings for channel black under emergency high-cost conditions. Then, effective March 25, DSC became the sole buyer and seller of all rubber grades of channel black, and the price to consumers was raised to 5¢ per pound in bulk.

Of considerable interest is the following tabulation of figures for channel black production during the last several years and the resultant year-end inventory.

CHANNEL BLACK PRODUCTION AND INVENTORY
(All Types Including Non-Rubber)
(In Thousands of Pounds)

Year	Production during Year	Year-End Inventory	Shipped during Year
1940	494,500	162,100	
1941	493,000	111,400	543,700
1942	428,700	237,600	302,500
1943	380,100	194,000	423,700
1944	413,700	56,000	551,700
1945*	525,000	?	?
1946*	600,000	?	?

* 1945 estimate from industry sources; 1946 estimate from WPB Rubber Bureau.

Also of interest are figures on the production rate, at the beginning of 1945, of channel and the several types of furnace black, the production rate of new facilities to be available in 1945, and estimates of 1945 production rates for the different blacks, and the totals.

FINAL 1944 PRODUCTION RATE AND 1945 ESTIMATED PRODUCTION RATE
(All Types of Rubber Grade Carbon Black)
(In Millions of Pounds)

Type	Production Rate End, 1944	Added Rate—New Facilities* 1945	Final 1945 Production Rate*
Channel Black ..	410	250	660
HMF Black	130	200	330
SRF Black	270	90	360
FT Black	100	20	120
Totals	910	560	1,470

* Anticipated production in 1945 for all types—1,230,000,000 lbs./yr.

These figures include the new expansions programmed during March, 1945, and although they normally could not be considered as contributing to 1945 production, with the great emphasis now being placed on the expansion program, some of this production may be realized.

It is certainly apparent from the first table of figures that although channel black production was down in 1943, shipments were sharply upward as compared with 1942. Production was increased somewhat in 1944, but shipments exceeded production by about 140,000,000 pounds, with the effect that the inventory position (all types) was reduced to 56,000,000 pounds. In a report on war production programs by Mr. Batcheller on March 24, it was stated that the carbon black stockpile (rubber grades) had shrunk to 20,000,000 pounds.

According to one carbon black manufacturer, the middle of 1943 was the time when the downward trend in channel black consumption was arrested and the time when the upward trend in channel black manufacture should have been started. The WPB, however, delayed approval for materials for repair and rehabilitation programs which would have maintained and increased production from established plants, and not until the Summer of 1944 was the program for what was called "incremental carbon black production" set up. At that time the WPB accepted commitments from seven carbon black companies to build new plants sufficient to produce approximately 200,000,000 pounds of channel black a year. As mentioned previously, additional commitments totaling $9,000,000 were made to four companies on March 15, 1945. In this connection it should also be mentioned that an estimate made public on December 29, 1944, by Mr. Krug called for 133,000,000 pounds of channel black and 101,480,000 pounds of furnace black for the first quarter of 1945, and the "Year-End Report" for the WPB Rubber Bureau issued on March 21, 1945, by James F. Clark, called for about 150,000,000 pounds of channel black and 125,000,000 pounds of furnace black for this same period. Actual production of both channel and furnace blacks was at a rate of about 80,000,000 pounds a month in March, 1945. The shortage as of April 1, 1945, appeared real because of suddenly increased demands, but all allocations for April were filled with "a grade of carbon black."

Some of the new carbon black plants will be in production within a month or two. The WPB, on March 29, listed 23 carbon black expansion projects with an estimated cost of $11,371,970 and a production capacity of 188,100,000 pounds of carbon black a year, as having been approved and granted AA-1 priorities on March 16. The companies included in this list and the number of projects for each were: Godfrey L. Cabot, Inc., (4), Cities Service Oil Co. (2), Columbian Carbon Co. (1), J. M. Huber, Inc. (1), Jefferson Lake Sulphur Co. (1), Charles Eneu Johnson (2), Phillips Petroleum Co. (4), Roxboro Steel Co. (1), and United Carbon Co. (7). Plants being built with private as well as DPC funds are all scheduled to be completed between April and December, 1945. A production of 100,000,000 pounds of all blacks a month is expected by the third quarter of 1945. Requirements for 1946 are given as 400,000,000 pounds a quarter.

Commenting on the substitution of other materials for carbon black, one producer states that the recent denial of carbon black for various civilian products such as soles and heels, and the drastic cuts in allocations for products other than military, has resulted in a tremendous and sudden demand for non-black pigments. Production facilities for these materials, such as calcium pigments and clays, are now generally overtaxed, and no further carbon black substitution can be made unless production facilities for the mineral pigments are expanded.

Mr. Starkie, now vice president of Witco Chemical Co., stated that the reason that the 1,200,000,000-pound annual rate of production of carbon black, referred to in the previously mentioned memorandum published in the September, 1944, INDIA RUBBER WORLD, was not reached on March 1, 1945, was the manpower shortage and also the delay in completing negotiations with the DPC, DSC, and OPA during the Spring of 1944 when the carbon black expansion program was being organized. This 1,200,000,000-pound production rate will be reached by July 1, 1945, but during the next 60 to 90 days, although all military requirements will be taken care of as they have been in the past, there will not be enough carbon black for all the passenger-car tires, mechanical goods, and footwear desired. Mr. Starkie mentioned that in trying to expedite the expansion of carbon black production in May, 1944, he had proposed a price of 4½¢ a pound for both channel and HMF blacks, which were selling at a ceiling of 3.3¢ a pound for channel and about 5¢ a pound for the HMF, but that this was turned down by the OPA. On the basis of an average price of 4½¢ for both blacks, generally acceptable to both producers and consumers, the carbon black companies could have financed their own expansion program, and work could have started at that time.

As a consultant to the WPB since September, 1944, Mr. Starkie said that he questioned WPB Rubber Bureau figures of October 30, 1944, which estimated a stockpile of 100,000,000 pounds of furnace blacks and 11,000,000 pounds of channel blacks on July 1, 1945. Even with the new extra effort and new projects for increasing carbon black production, it is very probable that the new WPB Rubber Bureau requirements as of March 5, 1945, for 1,118,000,000 pounds of carbon black for the nine months period from April 1 through December 31, 1945, will be short by 256,000,000 pounds.

Rubber Bureau 1944 Report

The year-end report of the WPB Rubber Bureau, dated February 1, was issued March 21 by Mr. Clark. Production schedules of 4,875,951 heavy-duty tires for the first quarter of 1945 will be substantially achieved despite shortages in carbon black and tire cord, but chances for achieving the greatly increased second-quarter production of 5,726,671 of these tires, as programmed last November, appears extremely unlikely, it was stated in connection with the release of this report. In fact, the second-quarter schedule for truck and bus tires was revised downward to 5,085,604 in an announcement made on March 17 by WPB Chairman Krug. The Rubber Bureau's 1945 second quarter schedule, the revision of March 17, and production for the second quarter of 1944 are given below:

TIRE PRODUCTION SCHEDULES

Type of Tire	Actual Production, 2nd Quarter, 1944	Scheduled Production 2nd Quarter, 1945 (Nov., 1944, Est.)	Scheduled Production, 2nd Quarter, 1945, Revised 3/17/45
Airplane	378,002	——*—	330,439
Truck and Bus:			
A-1	18,114	28,975	48,730
A-2	8,329	15,005	13,333
A-3-a	†604,555	183,672	136,288
A-3-b		1,101,518	1,086,011
A-4	594,797	947,455	767,454
A-5	1,471,953	2,180,996	2,061,788
A-6	862,700	1,269,050	972,000
Totals	3,560,448	5,726,671	5,085,604
Passenger and Motorcycle	4,022,192	5,000,000	3,165,000
Tractor-Implement			
Over 7.50	203,454	——*—	150,227
Under 7.50	287,756	——*—	230,000
Totals	491,210		380,227

* No tabulated figures available.
† Figures for A-3-a and A-3-b not given separately.

"The revised tire production schedules represent a program that is realistic," said Mr. Krug in releasing these figures. "The schedules indicate the number of tires by classification that can be made with the amount of carbon black that can be supplied domestic tire plants."

In addition Mr. Krug said: "However much production is stepped up, military demands will continue to be heavy. Tires will remain one of our most critical programs as long as the war lasts. All civilian vehicle drivers can help the situation by continuing to take the utmost care of the tires now on trucks, buses, passenger cars, and farm implements."

Highlights of the WPB Rubber Bureau Report included a statement that the greatly increased heavy-duty tire production program has made crude natural rubber the most critical of all strategic materials. About all the conversions of real significance from natural to synthetic rubber that are possible have been made. The November, 1944, production schedules required 144,000 long tons of natural rubber in 1945 and would have required withdrawals from the stockpile of about 35,000 tons. The new increased tire production demand that has developed since November may actually make the inroad into the stockpile even greater than 35,000 tons, and this reserve will probably drop considerably below 61,000 tons by the year-end.

Production of synthetic rubber scheduled for 1945 and 1946 has been given in the March 12 statement of the RFC. The Rubber Bureau further reveals that $22,000,000 more will be spent on the synthetic plants to achieve the 1,000,000-ton rate in 1945. A tabulation shows a 1945 requirement for 976,000 long tons of synthetic and 157,000 long tons of natural rubber, as compared with a supply of 1,020 tons of synthetic and 123 tons of natural.

The increase in tire production, as now scheduled, has aggravated shortages in essential component materials. Carbon black is critically short at the moment. Rayon tire cord cannot be supplied in sufficient quantity, but cotton tire cord can be substituted in some tire sizes provided enough is made available. Bead wire is in a tight position, but relatively simple measures, such as minor expansions in the industry and careful scheduling of production, are expected to correct this shortage. Changes in production schedules for the last three quarters of 1945, which are now being analyzed, indicate that requirements for both rayon and cotton cord will have to be adjusted upward. The amount of cotton cord substituted for rayon cord will have to be increased, and the relative essentiality of cotton tire cord *versus* tentage and other war needs for coarse cotton thread will govern the amount of cotton cord to be made available for tires.

In 1944, production of passenger-car tires totaled 18,864,000. As projected in November, 1944, the output for 1945 was set at about 22,000,000. This 1945 goal will probably not be met unless a very great increase in this production can be managed in the last half of 1945, when the supply of component materials is more adequate and if military requirements for large tires are revised downward by the fortunes of war.

Production of other short supply rubber goods, such as hose, belting, footwear, soles, heels, etc., must be expedited by supplying manpower where manpower is needed, or textiles where textiles are needed, and through the expediting of such expansion programs as may pertain to the individual item.

There must be a continuation and an extension of the conservation policies designed to obtain the last mile from every existing tire. This obviously includes a coordinated policy of factual information release and an avoidance of misleading statements as to the availability of tires to the public.

The Collyer Appointment

The appointment of Mr. Collyer as special director of rubber programs, as announced March 21 by Mr. Krug, did much to emphasize the new and critical problems of the rubber programs and at the same time gave assurance that with wide authority over the several phases of production of chemicals, textiles, and bead wire as well as rubber, and with Mr. Collyer's broad experience in the rubber industry, the solution of these "most critical" problems will be carried out at an accelerated pace. Mr. Krug stated that, with the full support of President Roosevelt and James F. Byrnes, director of the OWMR, Mr. Collyer had been drafted from industry for three months to head up the vital rubber programs. Mr. Collyer replaces Mr. Clark as head of the Rubber Bureau, but the latter will remain as long as necessary to cooperate with the new special director as he begins his task of increasing production of tires and everything needed to make them in the shortest possible time.

Mr. Collyer issued a statement at the press conference with Mr. Krug at which his appointment was announced.

"The position today, in terms of military and civilian shortages, is more severe than at any time since Japanese conquest of the world's principal natural rubber sources forced the United States to build a whole new industry — synthetic rubber — to provide the main raw material for tires and other war necessities. . . . In coping with the complex rubber problem the United States has been attacking a moving target. War demands have gone up. A new government program to provide increased military tire manufacturing facilities is scheduled to come into production during the latter months of this year, augmenting the expansion of existing plants and the creation of new manufacturing units undertaken in 1943 and 1944. Until these new plants are complete and in full operation, the nation's military and essential civilian tire stocks will continue to be critically short."

Commenting on shortages of component materials Mr. Collyer said: "More than 150 materials of different types and grades are needed for tires and other rubber products. Increases in production of many of these materials must be obtained to keep the scheduled expansion of the program in balance. Most urgently needed at present are supplies of carbon black, rayon cord, cotton cord and fabrics, natural rubber and bead wire. . . . . The manpower problem is of primary importance in all of these programs."

The necessity of maintaining essential cars, trucks, and buses on the nation's highways is inseparable from the task of supplying the vital needs of the Armed Forces, he added, and called for conservation of all tires now in service and strict adherence to driving speeds of 35 miles an hour and less by civilians.

"I am confident that the same teamwork on the part of government, industry, and the people, which has brought us this far toward solving our rubber problems since Pearl Harbor, can be relied upon in the present emergency," Mr. Collyer said in conclusion.

Additional WPB Tire Plants

The number of truck-tire expansion projects approved by March 15 totaled 39, with one of these not directly a tire project. A fortieth project announced on March 22 was for increased production of military soles, heels, and rubber tape. The additional projects for which the DPC has allocated funds are:

Robbins Tire & Rubber Co., Tuscumbia, Ala. A partial authorization of $500,000 for the construction of an additional building, expansion of present buildings, and procurement of new equipment will eventually provide a maximum yearly production of 1,200,000 large-size tubes. Initial production is expected in May.

Mansfield Tire & Rubber Co., Mansfield, O. A total authorization of $1,500,000 is for additional machinery and equipment. When the new facilities reach maximum production some time in September,

1945, approximately 191,000 truck tires and 300,000 truck tubes will be produced per year. Initial output is expected this month.

McCreary Tire & Rubber Co., Indiana, Pa. An authorization of $100,000 for new machinery and equipment with which a maximum production estimated at 24,000 truck tires per year is expected starting in June, with full capacity available in August.

The General Tire & Rubber Co. Waco, Texas. DPC has authorized $1,500,000, only part of the total funds required, for construction of a new addition to the present factory. A yearly production of 60,000 truck tires, 60,000 truck tubes, and 60,000 flaps is estimated from these new facilities. Initial production is anticipated for August, and full production 90 days later.

Lee Tire & Rubber Co., Kansas City, Kan. A partial authorization of $4,000,000 for the construction of a new factory was announced. Maximum yearly production is estimated as 270,000 truck tires, 270,000 truck tubes, and 270,000 flaps, starting initially in September, 1945, and reaching full production six months later.

Armstrong Rubber Co., Natchez, Miss. A partial authorization of $750,000 is for new buildings adjacent to the present factory and for additional facilities to have a maximum yearly production of 151,500 truck tires and 300,000 truck tubes. Initial production is scheduled for June, and full production 90 days later.

Carlisle Tire & Rubber Co., Carlisle, Pa. A total authorization of $200,000 for additional machinery and equipment to have a maximum yearly production of 180,000 truck tubes was announced. Initial production is expected next month, and full production 60 days later.

Mansfield Tire & Rubber Co., Mansfield, O. A second expansion project approved for this company consists of partial authorization of $1,700,000 for machinery and equipment to be installed in a new building, which is being financed by the Mansfield Co. with the assistance of tax amortization certificates. When in maximum production, the project will provide 148,000 truck tires annually. Initial operation is anticipated for August, with maximum output for January, 1946.

Dayton Rubber Mfg. Co., Dayton, O. A second expansion project for the Dayton Co. includes $1,000,000 approved by the DPC, to be used to construct a new factory building and acquire machinery and equipment. In addition the company will make additions to the present factory through private funds, with the assistance of tax amortization certificates. Maximum annual production of the privately owned and government financed facilities will be 500,000 truck tires and 500,000 truck tubes. Initial production is scheduled for August, and full production in October.

A partial authorization of $500,000, the third expansion for Dayton Rubber, is a special undertaking that will result in the production of 120,000 bogie wheel tires for military use. Additional machinery and equipment will be acquired, but no new construction is involved. Initial production is expected in August and full production in October.

Seiberling Rubber Co., Barberton, O. A partial authorization of $450,000 for new machinery and equipment was anounced. Building additions will be privately financed by Seiberling, with the assistance of tax amortization certificates. Maximum annual production will be 143,500 truck tires. Initial production will start in July, and full production will be reached in September.

Bearfoot Sole Co., Inc., Wadsworth, O. A partial authorization of $200,000 for a new building and machinery and equipment for the production of footwear was approved by DPC. The purpose of this authorization, which will total $550,000, is to transfer to Wadsworth all the footwear production previously done in the Seiberling plant at Barberton. This move will enable Seiberling to carry out its truck tire expansion which under this new arrangement will achieve 143,500 truck tires a year. Only in this way can the Seiberling project announced on March 8 be undertaken since the footwear production is essential to the Armed Forces and must be maintained.

Oliver Tire & Rubber Co., Emeryville, Calif. A partial authorization of $200,000 out of a total of $400,000 has been approved by the DPC. Of this total very nearly $100,000 will be supplied by the Oliver company. Two additions to present buildings are involved, and other buildings will be altered and new equipment acquired. When this project is in maximum production, annual production of 300,000 truck tubes is expected. Initial production is expected in July, and full production should be reached in September.

The B. F. Goodrich Co., Akron, O. An additional authorization of $250,000 has been approved for this company at Akron. The total estimated expense of the two projects now being undertaken by Goodrich at Akron amounts to $700,000 and will be used for new machinery and equipment for the production of 67,000 bogie tires a year. Initial production is scheduled for August and full production for October.

Pharis Tire & Rubber Co., Newark, O. A new authorization of $450,000 by the DPC was announced. It is estimated that the total cost of expansions for this company will total $2,400,000. This new project includes the erection of an additional building, as well as the acquisition of new machinery and equipment for the production of 120,000 additional bogie tires a year for direct military use. Initial production is scheduled for August, and full production for October.

Mohawk Rubber Co., Chattanooga, Tenn. A partial authorization of $1,250,000 out of a total estimated cost of $2,200,00 for a new factory has been revealed. Maximum production is expected to be 180,000 truck tires yearly, with initial production scheduled for January, 1946, and full production by March of that year.

United States Rubber Co., Chicopee Falls, Mass. A partial authorization of $250,000 out of a total of $400,000 for additional machinery and equipment capable of producing 43,200 truck tires and 369,000 truck tubes a year has been approved. Initial production is expected in September, and full production in October.

Plymouth Rubber Co., Inc., Canton, Mass. This project is not part of the truck tire expansion program, but is the fortieth expansion project for which the DPC has authorized funds during the last several weeks. A partial authorization of $90,000 out of a total estimated expenditure og $600,000 has been approved. Additional machinery and equipment to increase the production of rubber tape from 120,000 to 600,000 rolls a month and military soles to 180,000 pairs a month and military heels to 120,000 pairs a month will be acquired. Initial production is expected immediately after installation of equipment or during April, 1945, and full production within 90 days.

It is quite difficult to arrive at a completely accurate figure for the total amount of DPC funds authorized for these 40 projects since the authorizations are both partial and total, but an approximate figure of about $85,000,000 may be obtained from the information made public to date.

Trainer Assistant to Collyer

Just as we were going to press, it was announced from Washington that J. Edward Trainer, vice president in charge of production for the Firestone Tire & Rubber Co. for the last seven years, had been appointed assistant to Mr. Collyer. Mr. Trainer is on loan for a limited period from the Firestone company.

Mr. Collyer stated that Mr. Trainer's initial assignments will include work on the following problems: (1) assurance of sufficient supplies of more than 200 component materials needed for tires and other essential rubber products; (2) necessary manpower; (3) manufacturing expansions authorized for completion during 1945.

As far as carbon black is concerned, Mr. Trainer will work in close contact with the Special Inter-Agency Committee now working out the solution of the carbon black shortage and will represent his office and the Rubber Bureau on the Committee, Mr. Collyer added.

R-1 Tightened

Amendment 3 (March 6) to R-1, as amended November 9, 1944, differentiates between reclaimed rubber and reclaimed rubber, dispersions, and places the latter in a separate category. Moreover no reclaimed rubber, dispersions, may be used for experimental purposes without specific authorization.

Restrictions on the use of crude rubber for large truck tubes and further limitations on the use of carbon black are effected by Amendment 4 to R-1, issued March 15. According to WPB's Rubber Bureau, the effect of the first part of the order will be that, within six weeks, all conversion from crude to synthetic rubber in the large-size truck and bus tubes will be completed. Beginning April 1, all 16.00- and 18.00-inch cross-section tubes must be made with synthetic instead of natural rubber. After May 1, no 21.00-, 24.00-, 30.00-, or 36.00-inch cross-section tubes may be made with natural rubber. G-R-I (Butyl) will be made available for use as a substitute to natural rubber.

The conversions to synthetic rubber in the tube program will result in a saving of approximately 1,000 long tons of natural rubber a year, WPB said. As current schedules for heavy-duty tire production require more natural rubber than presently estimated imports, it is imperative that every step possible be taken to restrict consumption of natural rubber to preserve the dwindling stockpile, now less than 100,000 tons, WPB explained.

To make carbon black available for highly essential tires, tubes, and rubber products, Amendment 4 expands the list of items in which less carbon black will be permitted. The amount of carbon black for heater and radiator hose is reduced, except where the hose is used in military vehicles. Many molded rubber items will hereafter be made with 12% less carbon black, and sealing rings for jars, available for civilian purchase, will have 11% less. The Rubber Bureau estimates a saving of 250,000 pounds a month of carbon black by these restrictive measures.

Directions 2, 3, 7, 8, and 10 changing

Lists 24 and 25 of Appendix II to R-1 are revoked by the Amendment.

R-1, Appendix III, as Amended March 5, 1945, contains two changes, one relating to hose and the other to cotton consumption. No hose manufacturer may deliver, except on specific authorization of the WPB, the following types of hydraulic and gasoline dispensing hose: high-pressure one-, two-, and three-wire braided; medium pressure —Specifications AN-H-6a; low-pressure—Specification AN-ZZ-H626a; gasoline dispensing—Specifications AXS-1054, AXS-1055, 33-H-2, 33-H-8, 26551, FZ-ZZ-H-471, and similar types. Also, except in making passenger tires for the War and Navy departments, Maritime Commission, Aircraft Resources Control Office, and FEA for Lend-Lease, no manufacturer of passenger, motorcycle, or bicycle tires may use cotton in their production without specific WPB authorization.

The freeze limiting production of civilian passenger-car tires to approximately 5,000,000 during the first quarter of 1945 was continued indefinitely by WPB on March 7, pending clarification of the impact of the shortages of carbon black and tire cord on future passenger-tire output. The limitation was originally imposed as a temporary measure on December 23, 1944. The continued freeze will affect motorcycle and bicycle tires, besides passenger-car tires.

Because of the shortage of carbon black and other materials used in making camelback, WPB on March 16 issued Limitation Order L-345—Restrictions on the Production of Camelback—which prohibits during March through June, 1945, any person from making any camelback in excess of 137% of the total camelback he produced during December, 1944, and January, 1945, as reported to WPB on Form 3438. Production during any month, however, must not exceed 35% of total output for the March-June, 1945, period. Besides the preceding amount a manufacturer may also produce camelback to fill purchase orders placed directly by the War and Navy departments, Maritime Commission, Aircraft Resources Control Office, or FEA for Lend-Lease.

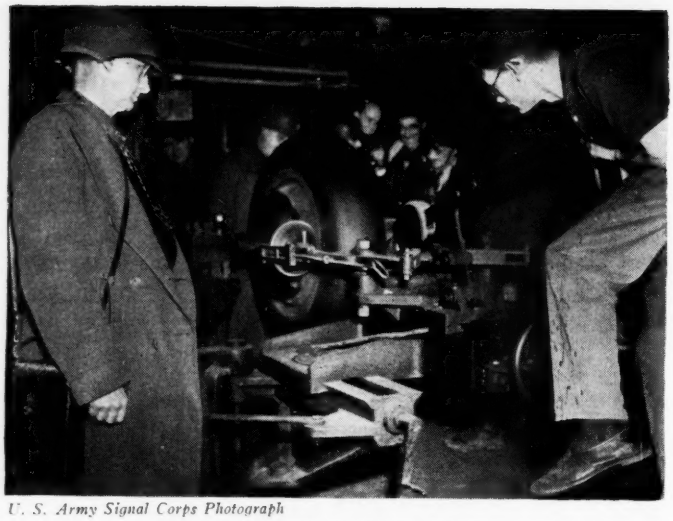
To facilitate the allocation of carbon black to consumers and suppliers, WPB, on March 9, stepped up the filing date for applications, by amendment of Schedule 32 of M-300 (Carbon Black). Applications for April allocations had to be filed by March 10 by consumers, and by March 15 by suppliers. Thereafter consumers' applications must be filed on the first of each month, and suppliers' on the fifth of each month. Previously consumers had to file on the 15th of each month, and suppliers on the 20th.

General Preference Order M-11a, as Amended February 17, 1945—Zinc Oxide—among other changes makes inapplicable certain preference ratings used on purchase orders for leaded zinc oxide and redefines "preferred order" and "leaded zinc oxide."

Because of a shortage in the supply of rosin, it has been placed under WPB allocation by Conservation Order M-387.

U.R.W. Visit Belgium Tire Plant

As mentioned last month, a delegation of United Rubber Workers labor leaders was invited by the War Department to get a first-hand picture of the war needs for tires, and toured Ordnance depots, port facilities, and reverse Lend-Lease tire factories in the European theater of operations. The accompanying illustration shows Freeman B. Van Houten, of Akron, O., a member of the delegation, watching a civilian worker "riding the stitch" of a tire being manufactured in a factory in Belgium.



U. S. Army Signal Corps Photograph

U.R.W. Delegation at Belgium Tire Plant

Scott Testers, Inc., is the new name of Henry L. Scott Co., Providence, R. I., manufacturer of testing machines. In announcing the change, David C. Scott, president and treasurer, stated that the change is one of name only and is made better to describe the firm in relation to the equipment it manufactures. Officers and management remain the same, including Frank A. Valentine, vice president; James M. Scott, secretary, and David C. Scott, Jr., assistant treasurer, at present on active duty as a lieutenant, United States Naval Reserve. All features of organization and personnel also remain unchanged.

B. R. Newcomb, president and general manager, John Waldron Corp., New Brunswick, N. J., has been named to serve on the committee on patents of the National Association of Manufacturers.

Dewey & Almy Chemical Co., Cambridge, Mass., through President Bradley Dewey, in its recent annual statement reported that sales have doubled since 1940 and much of the new volume will be permanent, necessitating $1,500,000 additional plant facilities.

Pacific Hard Rubber Co. plans construction of a factory building at 3215 E. 26th St., Vernon, Calif., to cost $5,000.

Ontario Section

(Continued from Page 79)

to make a wide variety of useful materials. For synthetic polymer manufacture it is necessary to have cheap power, low-cost hydrocarbons, a heavy chemical industry, and cooling water. North America possesses all these requisites. It is also necessary to know the reaction mechanisms and to learn how to handle and control them in a given time before manufacture of synthetic polymers on a commercial scale could be attempted.

With the aid of a blackboard Dr. Mark demonstrated several examples of addition and condensation reactions and showed that both types furnish plastics and elastomers. Three types of polymerization produce elastomers: namely, bulk, solution, and emulsion. Today most elastomers are made by emulsion polymerization, which has the advantage of being faster and permitting higher molecular weights to be obtained.

Next Dr. Mark discussed the process for making Buna-type rubbers and described the roles of modifiers, stoppers, etc. Using charts, he demonstrated that polar groups in elastomers aid adhesion and described and showed samples of polyethylene, polyvinyl chloride, polyvinyl acetate, polyvinyl alcohol, Butyral, Buna, neoprene and Butyl.

Mr. Gray, advertising manager of Dewey & Almy in the United States, then showed a colored film of Dewey & Almy plant and laboratories at Cambridge.

Woodcock Discusses Plasticizers

THE regular monthly meeting of the Montreal Section, Rubber & Plastics Division, Society of Chemical Industry, held on February 9, at the Ritz Carlton Hotel featured a talk by William Woodcock, of Carbide & Carbon Chemicals Corp. He spoke on plasticizers both from the theoretical and practical standpoint and expounded a plasticizer action theory that is becoming more widely held: namely, that plasticizer effectiveness with resins depends on the relative strength of the polar attractive forces between resin and plasticizer opposed to the intramolecular attractive forces of each of the two materials.

Monomeric plasticizers of the ester type, and ideal plasticizer properties were covered by the speaker, who also illustrated how the proper plasticizer selection for low-temperature flexibility of polyvinyl chloride would be carried out. Mention of use of these ester plasticizers in synthetic rubber was also made.

A dinner preceded the meeting, and then an open discussion took place as to whether the group would continue as an independent body or become a section of the Chemical Institute of Canada. A questionnaire is being submitted to all members.

OPA Revises Pricing and Rationing Orders

Prices for tire boots, patches, and reliners made from scrap materials were substantially reduced by new dollar-and-cent ceilings established on sales of these items. These ceilings cut back the prices of manufacturers and wholesalers approximately 20%; while at the retail level reductions generally range from 10 to 33⅓%. Heretofore the ceilings had represented March, 1942, "freeze" levels. OPA said that the new ceilings had been set at lower levels because there had been an undue rise in prices between October, 1941, and March, 1942.

An extensive study of costs, and consultations with individual manufacturers and the Patch & Reliner Manufacturers' Industry Advisory Committee showed that the reduced prices could be put into effect without adversely affecting production, OPA said. Meetings were also held with groups and individual members of the retail trade in New York, Chicago, and Washington, D. C., when general approval was expressed with the new ceilings as well as with other new provisions.

Most reliners, patches, and boots bought by the general public are made from scrap materials. To sell at the new ceiling prices every item must meet specified minimum quality standards, which are established for the first time. A maximum price of 1¢ a pound is established for reliners, patches, and boots not meeting the minimum specifications, whether sold at retail, wholesale, or manufacturing level.

Another new provision requires identification marks by manufacturers on all reliners, patches, and boots.

Announced at the same time was a complete revision of the tire and tube regulation, involving several changes in the establishment of ceilings for new and used tires and tubes, recapped tires, recapping and repair services. On these items none of the changes will alter the existing general price level. For each of these groups and services maximum dollar-and-cent prices have been added for new sizes and types of tires and tubes and the servicing of them. A new provision requires that the ceilings for sizes and types not listed in RMPR 528 shall be determined upon application to OPA's national office in Washington, D. C.

A new category, factory rejects, is established for new tires and tubes. Heretofore there were only two categories, new, and factory seconds. The retail ceilings for repaired factory rejects will be 25% under those for factory seconds. For unrepaired factory rejects the retail ceilings for the repairs needed must be deducted. All factory seconds and factory rejects will be marked as such by manufacturers.

Categories are also changed for the purpose of pricing used tires and tubes. Heretofore there were three groups: continuous tread, smooth tires, and basic tire carcasses. The revision establishes only two categories: used tires and basic tire carcasses. Each category is subdivided into three groupings, sound, repairable, and not usable, with a fourth category for used tires, known as limited service.

Maximum retail dollar-and-cent prices are established for the first time on used airplane tires. The new ceilings are in line with existing prices for comparable tires.

New ceilings are added for recapping pneumatic industrial tires and airplane basic tire carcasses and for passenger-car tires recapped with studded or mud and snow treads.

(Amendment 2 to RMPR 131—Camelback and Tire and Tube Repair Materials—and RMPR 528—Tires and Tubes, Recapping and Repairing, and Certain Repair Materials—both effective March 27, 1945, in the District of Columbia and the 48 states, and effective in May 11, 1945, in the territories and possessions of the United States.)

Amendment 7 to MPR 435—New Bicycle Tires and Tubes—effective February 23, gives a price for a 24 by 2.125 bicycle tire, a new one of Atlas Supply Co., Newark, N. J. The amendment also corrects the definition of ballon tires in the "Factory Seconds" paragraphs of Appendices A, C, and D by adding to the three sizes of tires involved a fourth size, 26 by 2.25.

Order 3 to RMPR 119—Original Equipment Tires and Tubes—establishes, effective March 20, ceilings for 12, and 14-ply 14.00-24 regular tread and desert-type truck and bus tires and tubes and for a four-ply 11.25-24/13-24 farm tractor tire and tube, all of synthetic rubber.

Amendment 9 to MPR 415—Certain Federal Government Purchases of New Rubber Tires and Tubes—effective March 26, provides that tire dealers, jobbers, and wholesalers may use the ceiling prices established in RMPR 528 when making sales of new natural rubber tires, tubes, and flaps to the federal government. These sellers will be able to obtain higher prices as a result of this action, which eliminates such sales from MPR 415. OPA said that ceilings in MPR 415 are based on the assumption that the sales covered would be by manufacturers direct to the government. Occasional instances occur, however, where the government finds it necessary to obtain supplies from dealers and wholesalers. Such sellers have been reluctant to sell because the ceilings on their sales to the government have been less than their usual sales prices and in some instances below cost. Amendment 9 makes possible the charging of regular retail or wholesale ceiling prices and will make it easier for the government to obtain supplies in the occasional instances where it is more practicable to purchase from other than manufacturers.

Wholesale ceilings for a new category of new tires and tubes known as factory rejects are set in Amendment 4 to RMPR 143—Wholesale Prices for New Rubber Tires and Tubes—effective March 26. The ceilings will be 25% less than those for factory seconds when the factory reject tire or tube is repaired before being sold, and less an additional 40% of the latter price when sold unrepaired. All factory rejects as well as factory seconds wil be marked as such by manufacturers. Only a very limited number of factory reject new tires and tubes are expected to be available for sale, OPA stated.

Order 32 to MPR 528, effective February 19, set retail ceilings for two sizes of new traction implement tires made by The Goodyear Tire & Rubber Co., Inc., Akron, O.

Amendment 93 (as corrected) to RO 1A—Tires Tubes, Recapping and Camelback—effective February 24, changes the first sentence of 1315.804 (j) to read as follows: "A manufacturer may transfer new truck tires to any dealer without certificate prior to February 24, 1945, by complying with the provisions of this paragraph." The provisions permitting manufacturers to transfer new truck tires to dealers without certificate were revoked because the conditions that originally necessitated such action, manufacturers' excess stocks and greatly reduced dealer inventories owing to invalidation of large truck tire certificates, have been corrected.

The next amendment, effective March 12, groups tires into Grade III (used passenger, tractor-implement, or industrial-type tire and defective new passenger tires), Grade II (used and defective new truck tires), and Grade I (all others). New Grade III passenger tires must now be branded with the word "reject." Changes in methods of transfer of tires are also given.

Amendment 95, effective April 1, cancels all certificates and replenishment portions of certificates or receipts dated prior to December 1, 1944. Also, previously the replenishment portion of a certificate or receipt for truck tires of cross-section 7:50 or smaller could be used by a dealer or manufacturer to replenish with a tractor-implement or a truck tire with a cross-section 7:50 or smaller. Now, however, the certificate or receipt is good only for a truck tire 7:50 or smaller. The third change provides that a dealer or manufacturer may transfer tires in exchange for the replenishment portion of OPA Form R-2 only if the transferor has endorsed his name and address thereon.

Amendment 96, effective April 1, provides that a manufacturer surrender monthly, valid ration evidence (replenishment portions of certificates or receipts dated on or after December 1, 1944) representing the number and type of tires transferred for which the exchange of ration evidence was required under RO 1A. Manufacturers must also keep designated records and file reports necessary to control their certificate and inventory accountability to the OPA.

Amendment 14 to RO 1E—Mileage Rationing: Tire Regulations for the Territory of Hawaii—effective March 1, makes among other changes, revisions in the sections on transfer of unrationed tires and eligible vehicles.

Amendment 135 to MPR 373, effective March 24, deals with retail sales of new tires and tubes in Hawaii.

Passenger-car tire quotas for March were unchanged from February. OPA explained that the WPB Rubber Bureau decided that 1,600,000 passenger-car tires, including motorcycle tires, could be released for March allocation. The Rubber Bureau earlier had announced that production of passenger tires in the first quarter would be limited to 5,000,000 tires through specific authorizations of cotton tire cord for passenger tires to each tire manufacturer. The 1,800,000-total tires made available in January and the 1,600,000 in both February and March brought the sum for the quarter to the 5,000,000 limit.

March tire quotas for trucks and buses, and for farm tractors and implements, also remained at February figures. In both truck tire and tractor-implement categories OPA said quota expansions in the spring-summer period might be made, but that the large anticipated demand of that period would probably exceed any quota increase.

Later last month OPA, in announcing the April quotas, stated that the passenger-tire ration quota is 37½% under March because of a drop in civilian tire production. Only 1,000,000 passenger tires, including motorcycle tires, will be available. The April quota is the first instance since last May in which fewer than 1,500,000 passenger tires have been available for rationing. OPA said the Rubber Bureau blamed the sharp decline in passenger-tire output on the seriously diminished supply of carbon black.

Considerable quota increases in truck and

bus categories and slight increases in tractor-implement categories were granted to cushion the big impact of demand in the warm-weather months.

Because of the seriousness of the tire supply situation, OPA said that beginning April 1 a tighter control of tire certificate accounting will go into effect. After discussions with a tire industry group over the past six weeks, a procedure has been devised whereby tire manufacturers and factory branches will report to OPA monthly the number of tires shipped and the number of certificates received. In addition to the report, manufacturers and branches will turn in to OPA verification centers the certificates they have received. This procedure is a part of all other rationing programs, but has not previously been applied to tire rationing.

A complication in putting this new plan into effect is the large number of old certificates now in the hands of manufacturers, dealers, and consumers. These old certificates constitute a threat to the even distribution of the limited supply of tires. For this reason, and to make the new program workable, these old certificates, dated before December 1, 1944, were cancelled April 1.

Consumers having these old certificates had until April 1 to get tires. Thereafter they may apply to their local War Price and Rationing Boards for replacement of the cancelled certificates. If they can show a need and tires are available within quota, they will be granted new certificates. Eligible consumers have let the certificates accumulate because of two main reasons, either they did not need them, or could not find tires to exchange them for, OPA explained.

The drastic cut in passenger tire quotas will allow War Price and Rationing Boards to grant new tires to only the most essential drivers. Some drivers will have to be denied. Those who are must rely on recapped tires.

The recapping situation, even apart from the April quota cut, has become steadily more disturbing in the past year, OPA said. It is estimated that half the tires needing recapping are not being attended to at present. OPA said that in December the estimated number of passenger tires requiring recapping was 1,200,000; while at the moment there are 3,250,000 tires estimated in that condition. OPA pointed out that recapping adds at least 10,000 miles to the life of a tire.

The arrival of warm weather, when the demand for new tires always rises sharply, will add to the gravity of the tire outlook, OPA said. This will be particularly noticeable this year, because the old tires on which most motorists must rely are feeling the effects of wear more all the time. It is estimated that most of the tires on the road today are at least three years old.

In setting larger truck and tractor-implement quotas, the Rubber Bureau recognized that, while passenger tires are important, the truck, bus and tractor-implement categories are even more essential. Nevertheless the granted increases in truck and bus categories are on a monthly basis much smaller than the requests for the quarter by Office of Defense Transportation, which was given only one-half its estimated needs.

The quota for tractor-implements using sizes larger than 7.50 is being made up in substantial part from inventories, OPA said. This means that inventories will be reduced during the second quarter. The tractor-implement tire quota for sizes 7.50 or smaller was made possible by the addition of 10,000 tires from prudent allotment savings in former months, OPA explained.

A tabulation of April quotas and reserves by tire types, including March quota figures, follows:

	April Quotas			
Type of Tire	Allocated	Reserves	Total Available	March Quotas
Passenger & Motorcycles (Grade 1 new tires)	916,500	83,500	1,000,000	1,600,000
Truck & Bus				
7.50 or smaller ..	253,365	13,335	266,700	216,000
8.25 or larger ...	124,700	23,150	147,850	110,200
Tractor-Implement				
7.50 or smaller ..	37,720	13,280	51,000	50,000
8.25 or larger ...	20,700	4,300	25,000	21,000

Heel and Sole Orders Changed

Dollar-and-cent maximum prices, effective February 23, were established for sales in the shoe repair trade of brown synthetic rubber heels and soles and for black synthetic rubber soles, by Amendment 19 to MPR 200—Rubber Heels and Soles in the Shoe Repair Trade. These ceilings, however, will cause no increase in prices to the public for the same quality heels and soles.

The WPB recently authorized the manufacture of brown heels and soles. The manufacture of these items was prohibited shortly after Pearl Harbor, but now they will be made of synthetic instead of natural rubber.

The new ceilings for manufacturers and wholesalers, on the brown heels and soles, are 20 % higher than the levels of March, 1942, for brown natural rubber heels and soles. This increase, OPA said, is necessary because of higher costs involved in making these items from Buna S compared with natural rubber. Wholesalers have been given the increase also because their prices are historically linked with manufacturers. Manufacturers' and wholesalers' ceilings for black synthetic rubber soles are set at the levels prevailing in March, 1942, for the same type of soles made with natural rubber.

The new ceilings of shoe repair shops for brown rubber heels attached are spelled out in dollar-and-cent at the March, 1942, levels for brown heels of natural rubber. No increase is provided because shoe repairmen will be able to absorb the increase allowed manufacturers and wholesalers on these heels, OPA said. For brown and black synthetic rubber soles attached, shoe repair shops continue with their March, 1942, "freeze" ceilings under the services regulation, as is the case with leather soles attached to shoes, except where specific area pricing orders may be issued.

Also provided are ceilings for shoe repair shops on both brown rubber heels and brown and black rubber soles that may be sold unattached. These are 40% of the ceilings for the same items when attached to shoes. There are, however, only a limited number of these sales.

The new ceilings for shoe repair shops on men's brown half heels attached are 45 to 50¢, depending on quality. They are 45 to 50¢ a pair for women's brown cuban heels attached, from 25 to 35¢ a pair for women's brown top lifts attached, and from 45 to 60¢ a pair for boys' brown whole heels attached.

Representative members of the wholesale and retail shoe repair trade, and the Rubber Heel and Sole Manufacturers' Industry Advisory Committee were consulted by OPA. The shoe repairmen consulted approved of the action. The manufacturers had requested a 28% rise over March, 1942, levels for brown heels and soles, but OPA studies showed that an increase of 20% was sufficient.

Amendment 10, MPR 477—Sales of Rubber Heels and Soles in the Shoe Factory and Home Replacement Trades—effective February 28, gives manufacturers' ceilings for 15 sizes of ½-inch heels made of brown synthetic rubber for boys' shoes. These heels are sold to shoe manufacturers under the trade designation "Junior." The heels are put on new shoes and are not sold separately to the public.

Other Orders Affected

Order 49 under Section 1499.19a of the General Maximum Price Regulation—effective March 19, covers sales of rubber grades of channel carbon black to the Defense Supplies Corp. and precedes issuance of new pricing provisions that will grant higher than normal ceilings for channel black produced under emergency high-cost conditions. The order authorizes producers to sell at ceilings that will be adjusted in accordance with the new ceilings to be provided. Order 49 is designed to promote production of this essential product until the new pricing schedule is completed. The order will terminate when the new ceilings become effective. The critical shortage of carbon black has led producers to use abnormally expensive materials and costly methods of production, OPA said. The contemplated action relates only to channel black which is produced under these conditions.

Order 31 to 1499.3 (e) (3), General Maximum Price Regulation, effective February 21, establishes maximum prices for Miracle Adhesives and R-Mir-Dek products.

Amendment 8 to MPR 406—Synthetic Resins and Plastic Materials and Substitute Rubber—effective March 17, adjusts dollar-and-cent prices for sales of two types of ester gum containing gum rosin.

MPR 580—Retail Ceiling Prices for Certain Apparel and House Furnishings—effective March 20, includes among the very many commodities covered the following: rainwear, suspenders, garters, arm bands, beachwear, bathing and shower caps, corsets, girdles, brassieres, garter belts, sanitary belts and aprons, supports, leg shields, bust forms, rubber sheets, and panties, athletic supporters, industrial protective rubber footwear, athletic shoes, waterproofed sheets and sheeting, Lastex fabrics, coated fabrics, mattresses, floor coverings. Excluded is Victory-line waterproof rubber footwear subject to RMPR 229.

An organizational meeting of the 14 members recently named to the Industrial Alcohol Industry Advisory Committee was scheduled to be held in Washington on March 28 to discuss with OPA officials provisions of MPR 28—Industrial Alcohol —which provides a cost-plus method for establishing ceiling prices. Among the committee members are: Lewis H. Marks, Publicker Commercial Alcohol Co., Philadelphia, Pa.; Wm. Krug, Jr., E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; and Henry A. Perry, Commercial Solvents Corp.; W. F. Reich, Carbide & Carbon Chemicals Corp., and Wm. P. Marsh, Jr., U. S. Industrial Chemicals, Inc., all of New York, N. Y.

EASTERN AND SOUTHERN

Schrader Celebrates 100th Anniversary

Perhaps the beginning of the Schrader industry was in 1844 when August Schrader, a skilled mechanic, set up a brass turning and finishing shop at 115 John St., New York, N. Y. At that time the City extended to 23rd St.

Watching an underwater race off the battery in lower Manhattan, Mr. Schrader was convinced he could improve the design and manufacture of the diving helmet used. This endeavor being a success, he turned to manufacturing air pumps and was given a diploma at the 1856 Industrial Fair for his air pump. From then on his name became well known, first receiving recognition in this country and then abroad.

When the *Maine* was blown up on February 15, 1898, in Havana, the company furnished diving equipment for inspection. History repeated itself when, on December 8, 1941, following Pearl Harbor, Schrader again filled a call for diving equipment.

In the 1840's the center of the rubber industry was located in New York. The Goodyear brothers, who had a shop near Schrader's, came to him for brass fittings for their rubber products and valves for their air pillows and life preservers.

Schrader was already an expert in producing metal parts for the rubber industry within five years after its founding. Since 1888, when pneumatic bicycle tires were introduced in England by J. B. Dunlop, the Schrader organization has been making valves for these tires. From 1891 on, design was improved until, in 1898, the standard tire valve was made with its core replaceable in one unit. This Schrader-type valve has been a world standard for more than 22 years and an American standard for 47 years.

This standardization has been a valuable aid to the war effort. Every valve cap and core on every bomber, gun mount, truck, staffcar, jeep, motorcycle, and bicycle is interchangeable in every standard valve on American and allied vehicles.

Schrader has also pioneered in the design of tire pressure gages, air chucks, tire valve tools, and air control and handling equipment.

In 1930, Schrader became a subsidiary of the Scovill Mfg. Co. and in 1935 was made a division of Scovill.

The following changes have recently been made in Schrader's sales organization: A. R. Baldwin, former district representative of the Los Angeles office, is now assistant manager of accessories sales at Schrader's Brooklyn headquarters. E. H. McClure, former district representative covering the Chicago area, will now devote his time to the agricultural market. J. H. Carruthers has been appointed district representative to replace Mr. McClure in the Chicago area. C. M. Huffman, who formerly covered the Rocky Mountain states with headquarters in Denver, has been transferred to the Los Angeles office; he will cover Nevada and most of California. Chaplain E. Lawton has been appointed district representative in the territory formerly covered by Mr. Huffman (Montana excepted) and will make his headquarters in Denver. Joseph C. Mason is now district representative to cover Montana, Washington, Oregon, and the extreme northern part of California. He will also serve Schrader distributers in Lewiston and Coeur d'Alene, Idaho. Mr. Mason will make his headquarters in Portland, Oreg.

This year Schrader begins its second century of service to the rubber industry.

Water Treatment at Kobuta

In making synthetic rubber from butadiene or styrene, one of the most important extra ingredients is water. For that reason when Koppers United engineers designed for the government a complete new synthetic rubber plant at Kobuta, a place where no town existed, some 35 miles down the Ohio from Pittsburgh, they consulted water conditioning experts before incorporating in their designs provisions for properly treating the raw waters of the Ohio for steam and for cooling purposes.

Chemical engineers of Hall Laboratories, Pittsburgh, were retained to supervise the water control and to specify needed equipment to treat the water for all uses.

The plant, producing two major ingredients of synthetic rubber, is actually operated for the government through the Rubber Reserve Co. Kobuta was named for Koppers and butadiene.

At the fifth annual conference on water control, sponsored by the Engineers' Society of Western Pennsylvania, Paul J. Stein, of Koppers United Co., formerly associated with Hall Laboratories, presented a paper describing the steps taken for water treatment at the new Kobuta plant, which was so successfully put into operation that in its first six months it was 50% ahead of schedule in its production of synthetic rubber materials.

In the production of one pound of butadiene from alcohol, approximately 20 pounds of steam are required for distillation purposes. As more than 1,000 tons of coal per day are required to supply the heat to the chemical reactions, an enormous amount of energy must be removed to effect the desired condensation or cooling, Mr. Stein reported.

To produce one pound of butadiene it is also necessary to pump 1,200 pounds of water from the river and to treat chemically 35 pounds of water for boiler use. With such a relation between product and water, Mr. Stein said, the careful attention given water facilities was completely justified. Major filtration plant equipment included: Three 14 o.g.p.m. Spaulding precipitators, total capacity, 4,200 g.p.m.; six gravity flow anthrafilt filters, total capacity, 3,900 g.p.m.; six gravity flow carbonaceous Zeolite softeners, total capacity, 3,600 g.p.m.; one acid mixing chamber for pH control; and chemical handling equipment consisting of one Airevey for unloading chemicals and a Toledo scale. As far as boiler water treatment is concerned, sodium metaphosphate is fed directly into the upper boiler drum by means of small reciprocating Proportioneer pumps to satisfy the demands of the residual hardness of the boiler feedwater. All boilers are equipped with continuous blowdown lines discharging into a 165-pound flash tank.

During the design and construction periods it was planned to produce 80,000 tons of butadiene a year. The water pumping facilities were conservatively designed adequately to supply cooling water for this output. With the intensification of the aerial warfare came the demand for more and more aviation gasoline. This meant that, if the air fleets of the United Nations were to receive the fuel needed, the butadiene to be produced by the petroleum industry would, by necessity, have to be curtailed. The demand for synthetic rubber, nevertheless, continued to exist and actually became greater. Faced with such a situation, it was imperative that the plants that convert alcohol into butadiene should produce every pound that they possibly could. As a result, the output of butadiene at Kobuta is more than 50% greater than originally contemplated. Such a large increase in production meant that the River Pumping Station, instead of having ample capacity, was forced to operate at practically full rating during the summer months.

In the designing of the plant even protection against flood waters was taken into account by the designer, Morris Knowles, Pittsburgh engineer. It is therefore possible for the plant to withstand a flood stage six feet higher than the crest reached in the disastrous flood of 1936 when all Pittsburgh's downtown section except the very highest arteries were covered. This would mean that water could rise 32 feet above the normal pool before pumping operations would have to be curtailed.

More Carbon Black Scheduled by United Carbon

United Carbon Co., Charleston, W. Va., in its recent annual report to stockholders, stated that sales of carbon black last year were of record proportions, 228,720,742 pounds, sold for $8,504,120, compared with 147,601,882 pounds and $5,277,033 in 1943. The production figures for the two years were 189,499,233 and 132,574,758 pounds.

As the demand for carbon black is geared to the manufacture of rubber products, now at an all-time high and promising to continue so until the world has been retired, United Carbon has provided additional facilities for a larger supply of carbon black. Plant facilities at Ryus, Kan., are being expanded to produce 24 million more pounds of furnace black annually. The new facilities are scheduled for operation this month. The company is likewise engaged in an extensive program of repairs and rehabilitation of its channel plants to obtain maximum production.

The carbon black plant being erected at Odessa, Tex., suggested by the WPB and financed (more than $6,000,000) by DPC to augment channel black output, will have an estimated yearly capacity of 41 million pounds. Initial operations are set for May. As a lessee of DPC, United Carbon will operate this plant.

The company is also constructing, with government funds, a 20-mile pipe line to transport an additional supply of gas for the plant at Aransas Pass, Tex. This gas also will increase the production of carbon black at this plant. The pipe line is expected to be in operation soon.

Upon completion of the projects now under construction the annual rate of carbon black output will be about 280 million pounds.

Shell Oil Co., Inc., 50 W. 50th St., New York 20, N. Y., at its recent annual stockholders' meeting elected as directors P. E. Lakin, vice president in charge of marketing, New York, and E. F. Davis, vice president and chief consulting geologist, Los Angeles.

Tire Output to Be Upped

To help meet the increased demand for vitally needed military tires, United States Rubber Co., 1230 Sixth Ave., New York, N. Y., this year will more than double its prewar capacity to produce large-size tires of the military type, President Herbert E. Smith announced last month. When this program is completed this year, the company will be able to produce more than twice as many large-size tires and 75% more large-size tubes of the military type than in 1941.

The plants and their new schedules were listed by Mr. Smith as follows: An increase of 173% in military-type tires, including plane and truck, is planned at Los Angeles, where capacity production is expected to be reached in April. The Fisk plant at Chicopee Falls, Mass., expects to produce 153% more truck tires. Capacity output is set for June. A rise of 219% in military tire output, the largest percentage gain at any of the four plants, is scheduled at Eau Claire, Wis. In units Detroit will continue to be the company's largest producing tire plant: included will be truck, plane, and bogie tires. At both Eau Claire and Detroit all facilities are scheduled to be in operation by August, and production at capacity before the end of the year.

The Fisk division is now producing a new truck tire built of rayon cord. Stronger, but fewer plies in the construction make for greater durabiilty. These tires are said to be easily repaired as they offer greater resistance to rupture growth. Mr. Ray also stated that a 375% increase has been noted in rayon synthetic truck tire performance as compared with cotton cord.

Personnel Activities

Harold B. Morris has been named technical representative of the Naugatuck chemical division, U. S. Rubber, and Dispersion Process, Inc., in the Akron area, which includes Ohio, Indiana, Kansas, Kentucky, West Virginia, Tennessee, Buffalo, and Pittsburgh. Mr. Morris has been returned to inactive reserve status from a captaincy in Chemical Warfare Service after serving three years. Born in Youngstown, O., he attended the local grammar and preparatory schools, and was graduated with a B.S. degree in chemistry at Gettysburg in 1930, then completed his scientific education at the University of Akron. Before enlisting in the Chemical Warfare Service of the U. S. Army, Mr. Morris had had engineering technical sales experience in the use of latex and rubber dispersions with leading rubber manufacturers, including U. S. Rubber.

Sidney M. Cadwell, director of tire development for U. S. Rubber, has been made assistant general manager of the company's tire division with headquarters at Detroit, Mich., where he will be responsible for production, development, and engineering for the division.

D. W. Walsh, sales manager U. S. Tires, has announced the appointment of H. C. Oliver as district manager of the Atlanta district. Formerly district manager at Memphis, Mr. Oliver replaces H. H. Brantley, who resigned to enter the retail tire business. C. G. Currie succeeds Mr. Oliver at Memphis. Previously Mr. Currie had been active in a liaison capacity between the tire development and engineering department, and the sales department in New York.

Max C. Welshimer has been named manager, heavy-service tire sales, Pacific Coast division, with headquarters at 2901 10th Ave., Sacramento, Calif. Mr. Welshimer had previously served as merchandising representative in the San Francisco branch.

The U. S. Dealer Advisory Council also held a three-day session in Detroit. The first two days, March 15 and 16, the meeting took place in the Book-Cadillac Hotel; a trip through the factory at Detroit occupied the concluding day's schedule. Among U. S. Rubber executives contributing to the program were Dr. Cadwell; Chester Ort, divisional manager of Chicago; R. W. Collings, divisional manager of New York; W. A. MacConnell, branch manager of Detroit; R. A. Blake, general service manager, tire engineering and service department; D. W. Walsh, general sales manager, U. S. Tires; A. B. Fennell, trade sales manager; W. D. Baldwin, merchandise manager; C. A. Ostrom, manager sales operations; J. G. Schaefer, advertising and sales promotion manager; W. F. Wrightnour, manager business development; and T. J. Segrave, who acted as secretary for the Council.

Fisk officials and the Fisk Distributor Advisory Council met February 21-22 at the Edgewater Beach Hotel, Chicago, Ill., to discuss tire distribution, merchandising, advertising, sales promotion, forward plans, trends, and policies. Speakers included J. C. Ray, Fisk general sales manager, and H. N. Hawkes, assistant general manager, U. S. Rubber tire division. Members of the Fisk general office staff and certain factory personnel also attended the Council sessions. The two-day meeting was preceded by a conference of all Fisk district managers at which Mr. Ray presided.

Germany received one of its biggest surprises during the D-day invasion of Normandy. Expecting to find the tanks stalled in the surf and on the beaches, they found instead that the tanks rolled forward with blazing guns, overcoming the German erected barricades along the coastline. The American heavily armored tanks are so thoroughly waterproofed that they can take part in an amphibious operation without becoming "drowned out." U. S. Rubber engineers state that giant tanks can operate in six feet of water and go ashore fighting. At this time the War Department will not permit disclosure of the method used to keep the vehicles waterproofed.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., at the specific request of the government, plans erection of a new plant, the Sabine River Works, near Orange, Tex., to increase nylon output for military purposes. Work on the project, estimated to cost about $20,000,000, is to start at once on a tract of about 1,000 acres.

Du Pont in its recent annual report to stockholders revealed that last year output of high-tenacity rayon yarn for aircraft and heavy-duty truck tires is at the rate of 60 million pounds a year, or 3½ times the 1942 figure. Also, about 55,000 long tons of neoprene were manufactured in 1944, and capacities are now being enlarged to make 70,000 long tons a year.

C. H. Greenewalt has been made an assistant director of du Pont's development department, to be in charge of activities in which technical considerations predominate. H. E. Ford, now an assistant director of the department, will be in charge of the more commercial type of activities of the department.

Synvar Resins Offered

In collaboration with Synvar Corp., Wilmington, Del., Wilmington Chemical Corp., 10 E. 40th St., New York, N. Y., has announced that it can now offer a complete line of urea formaldehyde and phenol formaldehyde resins in addition to specially developed plastics for the rubber industries. In the near future thermoplastic resins will also be available. The company stated that a new plastics research program has been under development for some time, directed towards those problems of the rubber industry which involve the use of synthetic resins.

Yarnall-Waring Film

The purpose of this 16 mm. Kodachrome new film is to show the engineering reason behind every Yarway product, to show applications of these products, and to show the manufacture of them. Close-up, cut-away shots show the operation of boiler blow-off valves, impulse steam traps, expansion joints, liquid level indicators, etc. Impulse steam trap installations on vulcanizers, platen presses, and calenders at the Lee Tire & Rubber Co. are included. Lowell Thomas acts as narrator for these films. Highlights of the film are: product maintenance, research facilities, metallurgy, production testing, product application, and service tests.

This film is available for showing before employe groups, technical societies, engineering schools and other organizations, and may be obtained from Department M, Yarnall, Waring Co., Chestnut Hill, Philadelphia 18, Pa.

The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York 22, N. Y., has announced the election of Robert J. Page as chairman of the sundries division. In 1938, Mr. Page was conducting special industrial surveys for the Reconstruction Finance Corp. relative to loans made by that agency to industry. When, after the outbreak of the war in Europe, RFC organized subsidiary corporations for the acquisition and production of strategic and critical materials, Mr. Page was designated assistant to the chief of the administrative division of Metals Reserve Co. He joined R.M.A. in January, 1945. Mr. Page received his formal education at the universities of Oregon and Idaho and thereafter served more than four years as management engineer and consultant to various manufacturers in the marketing, production control, finance, and corporate organization fields.

American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y., recently purchased for its Calco chemical division, Bound Brook, N. J., a factory site along the Ohio River, near St. Mary's, W. Va., consisting of 800 acres of land. This acquisition will provide a location for the development of new products whose basic raw materials are available in the Ohio Valley trade center. It will also enable the Calco organization to broaden its activities through the introduction of new products developed by the Cyanamid organization at Stamford, Conn., as well as those developed by Calco's own research group. Because of wartime restrictions on building, Calco is not yet in a position to determine when building will be started on the new plant site.

American Viscose Corp., 350 Fifth Ave., New York 1, N. Y., has purchased a site at Radford, Va., for construction of a plant for making viscose process rayon staple fiber. Construction work will not be started until the progress of the war makes it possible to obtain the needed materials and equipment. The Radford site was selected after several surveys were made of prospective locations, and an analysis of the water in New River showed it suitable for use in rayon production.

M. Barbanell, Inc., crude rubber importer, 80 Broad St., New York 4, N. Y., at a board meeting March 22 elected Joseph S. Cornell president to succeed the late Morris Barbanell. Mr. Cornell, a vice president of the company since 1940, had previously been a member of Commodity Exchange, Inc. A graduate of Lafayette College (Class of '36), Mr. Cornell also is, and has been for the past two years, technical adviser of the Bristol Mfg. Corp., Bristol, R. I.

Parkersburg Products Co., Parkersburg, W. Va., a subsidiary of the Pharis Tire & Rubber Co., Newark, O., will treble its production, according to Millard R. Bell, general manager, and to meet the heavy demand of the Armed Forces for rubberized pneumatic lifting bags used in aircraft salvage will hire approximately 125 extra workers for the period between March 1 and May 1.

The lifting bag is an ingenious device for use in repairing damaged aircraft, lifting the wing or tail in the manner of an automobile jack, but distributing the weight at the same time. When the aircraft landing gear is damaged, for example, lifting bags are placed under the wing or tail and inflated with low air pressure. Repairs can be made easily with the plane raised by the bags. Made of black rubberized fabric, the bags are constructed in three compartments in order to hold them in shape and prevent billowing when inflated.

The Parkersburg company also manufactures fuel cells for the Army Air Force.

The Glenn L. Martin Co., Baltimore 3, Md., has announced that Robert H. Kittner, formerly engineer with the American Hard Rubber Co., New York, N. Y., with which he had been associated 15 years, has joined the Martin company as manager of its newly created plastics and chemicals division and will have complete charge of the development program of Marvinol products. Clayton F. Ruebensaal, co-inventor of Marvinol, has been made technical director of the division.

Stauffer Chemical Co., 420 Lexington Ave., New York 17, N. Y., recently announced plans to expand its Hammond, Ind., sulphuric acid plant to meet accelerated wartime demands and to insure sufficient tonnage for postwar activities. Stauffer officials said that this increase in capacity will require considerably more floor space, so a permanent structure is in process of erection, which should be completed about July 1. They added that Stauffer's policy of shipping sulphuric acid in tank cars, drums, and carboys to this area will not be interrupted or altered.

Twin City Rubber Works has moved from 111 S. Second St. to 321 W. Lake St., Minneapolis, Minn.

MIDWEST

Sam A. Davis

Davis Heads Hall in Chicago

Sam A. Davis, formerly of Akron, O., has been made vice president and general manager of the Chicago offices and plant of The C. P. Hall Co. of Illinois, C. P. Hall, company president, announced last month. Mr. Davis joined the Akron chemical supply concern in 1923 and was promoted from clerk to sales representative in 1936, when he moved to the Chicago offices. He will head the company's new manufacturing plant scheduled to open there this spring.

His present address is 7342 S. Shore Dr., Chicago.

Johnson Entertains Press

With Harvey Blankenship in charge, the trade press was entertained at a luncheon given by S. C. Johnson & Son, Inc., Racine, Wis., on March 15, in its new modern office building. The luncheon was followed by motion pictures.

Particular attention was focused on wax finish for rubber which retards oxidation and sun checking, greatly improves appearance, and acts as a dry lubricant. Rubber tires for automobiles and airplanes can be given protection and beauty of a wax finish. Rubber hose, stair treads, rubber heels, soap dishes, surgeon's gloves, refrigerator gaskets, and rubber toys are some other products greatly improved by the wax finishes.

This non-flammable Johnson wax is made in clear and black, being suitable for articles made from Latex as well as molded rubber products.

National Safety Council, 20 N. Wacker Dr., Chicago, Ill., has elected as trustees W. S. S. Rodgers, chairman of the Texas Co., and Herbert E. Smith, president of United States Rubber Co., both of New York, N. Y.

Marbon Corp., 1926 W. Tenth Ave., Gary, Ind., has added to its staff as chief chemist A. G. Susie, formerly with the consulting firm of Gustavus J. Esselen, Inc., Boston, Mass.

Stanco Opens Chicago Office

Maintaining its policy of giving timely and adequate service to the rubber industry, Stanco Distributors, 26 Broadway, New York 4, N. Y., has opened an office at 75 E. Wacker Dr., Chicago 1, Ill. (State 6733). W. H. Peterson is the technical representative for the area covering Illinois, Indiana, Missouri, and the surrounding territory.

Mr. Peterson came to Stanco Distributors in December, 1943, from the Office of the Rubber Director, War Production Board. Prior to this connection he was associated with Haartz-Mason-Grower Co., Watertown, Mass. Mr. Peterson's experience in the application and production of synthetics, coupled with his practical factory experience has qualified him to give good technical service to this important area in the rubber industry.

Ball Joins Midwest Rubber

John M. Ball, for the last 24 years a salesman and then technical editor for the R. T. Vanderbilt Co., New York, N. Y., resigned, effective March 1, to become associated with the Midwest Rubber Reclaiming Co., East St. Louis, Ill., as its eastern representative. For the time being he will maintain headquarters at his home, Millstone Road, Wilton, Conn.

Mr. Ball graduated from Cornell University in 1916, and after a period of service with the Goodyear Tire & Rubber Co., the Chemical Warfare Service in World War I, and the Manhattan Rubber Mfg. Co., he joined the Vanderbilt organization in 1921. He was made editor of the *Vanderbilt News* in 1940, and after editing the "1942 Vanderbilt Handbook," Mr. Ball went to Washington and the WPB as a dollar-a-year man for 18 months. Under the direction of H. E. Simmons and E. B. Babcock, he prepared technical bulletins on the compounding of synthetic rubber from data submitted to the Rubber Director's Office by the various industry technical committees.

Mr. Ball enters the reclaiming industry at a time when technical problems are increasing in importance. Midwest Rubber established a research program on reclaiming synthetic rubber scrap at Massachusetts Institute of Technology in 1938, and that program is being continued under strong leadership.

Phelps Dodge Copper Products Corp., New York, N. Y., on March 20 announced expansion of its permanent production facilities by construction at Fort Wayne, Ind., of a $4,500,000 wire and cable plant, which will be fully equipped for copper rod rolling and for wire drawing, stranding, and insulating on a tonnage basis. About 31 acres have been acquired for the project and operations preliminary to actual construction are already well under way. Building will begin just as soon as government restrictions allow. When completed, the plant will employ about 4,000 persons at full production. The new mill, being built by Phelps Dodge without government assistance, is not primarily for increased production of war materials, but will be a permanent addition to the nation-wide manufacturing facilities of the company. The expansion was decided upon because of the certainty of increased postwar demand for the firm's products and in order better to serve customers in the Midwest.

OHIO

Firestone Laboratory Completed

Completion of one of the largest and most modern research laboratories ever created for the development of improved rubber and plastic products was announced March 1 by John W. Thomas, chairman of the Firestone Tire & Rubber Co., Akron. The $2,000,000 laboratory will bring immediate acceleration of research into improved synthetic rubber for military tires, electronic vulcanization of rubber, lighter flak vests for airmen, and dozens of other wartime projects. Plastic dresses and suits, tires in which synthetic rubbers of various types are "tailored" to fit the needs of civilian motorists, rubber and plastic films to permit air transport of fresh tropical fruits to American dinner tables, and luxurious rubber mattresses and cushions are typical of the postwar projects which will undergo further development in the new laboratory.

Completely air-conditioned, the laboratory has prefabricated steel inner walls and partitions which can be moved to rearrange completely the interior of the building. Constant temperature and humidity control has been arranged for an infra-red room, an electric measurements room, and a physical testing room. There are also a large library and an outdoor aging laboratory. Other features include an electronic microscope which magnifies 20,000 times, X-ray diffraction apparatus, a quartz spectrograph, and dozens of pieces of equipment designed by Firestone engineers especially for the new laboratory.

Textile and metals research, as well as rubber and plastic projects, will be conducted in the new laboratory. Distilled water from taps, steam, vacuum action, compressed air, and a variety of electrical currents are a few of the service units in each research room.

Heavier Cord for Tires; Other Announcements

Firestone has reported that thousands of additional military tires are being produced through a new development in tire construction, the use of heavier rayon cord. An advantage of the use of such cord is greater strength of the tires although they contain about 25% fewer plies. Production has been speeded by cutting the time required to build the tires. This heavier cord is gum dipped, and this process bonds the cords tightly to the rubber in the tire plies and prevents separation from the rubber in the tire as might be expected with the heavier cord. The new cord has a tensile strength of 34 pounds as compared with the 16½ pounds for the lighter cord. It is 0.034-inch thick which is 0.010-inch thicker than the previous cord.

Firestone has announced that a government approved speed test, to determine whether war-developed synthetic rubber tires on the cars of users would stand up under the tougher conditions of faster speeds after the war, was carried out at the Indianapolis Speedway on November 29, 1944, under supervision of the AAA. These stock synthetic-rubber tires were driven at an average of more than 100 miles an hour without a blowout. Wilbur Shaw, three-time winner of the Indianapolis Sweepstakes, drove the test car. Automotive engineers regard this 500-mile run on the brick and asphalt speedway at an average of more than 100 miles an hour as equal to 50,000 miles of ordinary driving.

John L. Cohill has been appointed president of The Firestone Aircraft Co., and D. W. Anderson succeeds him as vice-president. Mr. Cohill, associated with Firestone for 20 years, had been the aircraft company's vice president since September, 1942. Mr. Anderson had been its sales manager.

A native of Altoona, Pa., Mr. Cohill was educated in the public schools there, at Carnegie Institute of Technology, England's Royal Military Academy, and Oxford University and was a captain in the British army during the last war before joining Firestone. After serving with Firestone in Calcutta, India, Mr. Cohill came to Akron in 1925 to become assistant export manager. Five years later he went to Buenos Aires as vice president of the Firestone de la Argentina plant. Then in 1936 he became managing director of the company's South African interests. He remained there until 1941, when he returned to Akron as manager of the company's Bofors gun plant, a position he held until named vice president of Firestone Aircraft.

Mr. Anderson, a 1933 graduate of Purdue University, has been associated with Firestone's sales and engineering departments for 11 years. He was sales manager of Firestone Aircraft's Pacific Coast division before coming to Akron in April, 1944.

L. G. Hummel

Hall Advances Hummel

L. G. Hummel has been appointed secretary-treasurer of The C. P. Hall Co., in Ohio and California, according to Charles P. Hall, company president. Mr. Hummel, who adds the duties of treasurer to his former position as secretary of the concerns, also is secretary-treasurer of the C. P. Hall Co. of Illinois. He joined the chemical sales and manufacturing firm in 1938 as an accountant and office manager. Previously he had been associated with Chandler, Murray & Chilton, of Akron, and with International Harvester Co., Cleveland.

Oklahoma Tire Factory Ready

Announcement that the new plant of The B. F. Goodrich Co., Akron, in Miami, first tire factory in Oklahoma, is now in operation was made February 26 by J. W. Frasche, factory manager. First tires produced were of a military type and size urgently needed by the Armed Forces. When in full operation this plant will produce approximately 200,000 pounds of finished product daily and will provide employment for about 750 men and women. The rubber plant, the main factory building of which is 1,200 feet long and 300 feet wide, will use as much electrical power in 24 hours as a city of 20,000 population and will consume 4,320,000 gallons of water daily, Mr. Frasche also stated. This plant will also house a modern cafeteria, locker and shower rooms, and a fully equipped dispensary.

In addition to Mr. Frasche the Miami staff includes the following members trained in various plants of the company from coast to coast: Robert Schlemmer, personnel manager; Fred Barnes, plant engineer; C. H. O'Brien, office manager; Gordon Anderson, manager, industrial engineering; Leo Quackenbush, manager, transportation and warehouses; Clifford Norris, general foreman, processing departments; Al Morgan, general foreman, tire assembly departments; Roy Thomas, general foreman, tire curing departments; Ralph Hutchinson, general foreman, inner tube departments; Charles Lear, shift superintendent; Earl Carpenter, manager, compounding and raw materials; James Stevenson, manager, tire and tube construction.

The Miami factory, in which the company is expending in excess of $6,500,000 for plant and equipment, was authorized late in 1943 and construction work started in the Spring of 1944.

The newest manufacturing division of the far-flung Goodrich organization is the fifteenth in the United States and is the fourth designed principally for the manufacture of tires and tubes. Other company tire plants are now in operation in Ohio, Pennsylvania, California, and a fifth tire factory, comparable in size to Miami, will be built and operated for the government in Alabama, it was recently announced by Defense Plant Corp.

Goodrich has taken options on land near Avon Lake, O., as a probable site for erection of an experimental war chemicals plant, and it is expected that construction work will be started during the next few months after government approval of the project has been obtained. The B. F. Goodrich chemical division now operates plants in the states of Ohio, New York, Kentucky, and Texas.

Goodrich Men Honored

Harold W. Rehfeld, Goodrich tire technician who recently returned to this country after serving as technical adviser and expert consultant to the Commanding General of the Army Service Forces in France, has received a commendation for exceptional civilian service from the War Department, the highest award given civilians for services in the war effort by the Department. The commendation was made by Henry L. Stimson, Secretary of War, in recognition of Mr. Rehfelds exceptional accomplishments in the performance of his special mission to French and Belgian tire companies.

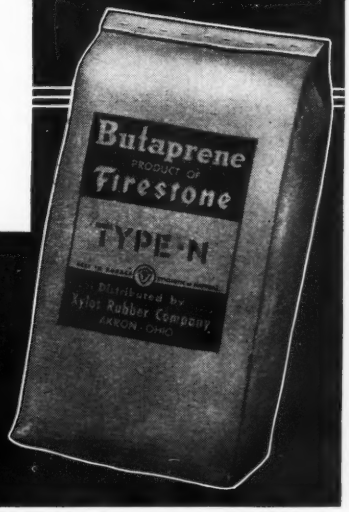
S. E. Nickerson, in the molded goods department of the industrial products sales division, recently completed 40 years of service with his organization; while E. C. Slaughter, industrial products salesman in the Chicago district, has rounded out 35 years.

Which of these important properties DO YOU WANT IN A SYNTHETIC RUBBER?

WANT a rubber that doesn't swell or soften in oils and fuels — one that's ideal for gaskets, sleeves, packings, diaphragms, and other oil-immersed parts? There's a Butaprene-N rubber for the job! Want one that is flexible even at minus 70° Fahrenheit? One that performs at a blistering 300°? Then look into Butaprene-N! You'll find these new Butaprene Synthetic Rubbers by Firestone remarkably versatile. They're more resistant to abrasion than natural rubber, have high tensile strength, good elongation, low compression set.

Why not find out what these remarkable new Firestone synthetics will do for you? For complete three-color chart on physical properties of Butaprene-N Synthetic Rubbers write Xylos Rubber Company, Akron 1, Ohio.

THE SYNTHETIC RUBBER OF A THOUSAND POSTWAR USES



Butaprene N by Firestone

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New Farm Tire Plant Open

One of the largest and most modern farm tire plants is now in operation in a newly completed addition to the Goodyear Tire & Rubber Co.'s plant at Gadsden, Ala. Hundreds of farm tires of various sizes are now being shipped from the plant to farm tire users throughout the country. Goodyear officials said 21 sizes will be produced when the plant is in full operation. A feature of the plant is its practically unbroken production line from the mill rolls and Banbury mixers at one end to final inspection and the shipping platform at the other end. This addition to the Gadsden plant adds about 256,000 square feet of floor space to the original facilities, affords employment for several hundred persons, and is part of a $30,000,000 expansion program undertaken less than a year ago by Goodyear throughout the country.

Transfer of Personnel

E. T. Ruffner has been transferred from the superintendency of Goodyear's Topeka, Kans. plant to a similar post at the company's new plant in Nashville, Tenn. He is succeeded at Topeka by L. E. Spencer.

The Nashville factory is now in process of construction as a part of the government's most recent program for the expansion of military tire production. It is expected to start operations early next fall. Meanwhile Mr. Ruffner's new assignment calls for selection of personnel for the Nashville operating organization, a duty which he fulfilled for the Topeka plant, as well as supervision of various other steps in the construction and equipment stages of the Nashville plant.

Mr. Ruffner, who started with Goodyear on its production squadron 27 years ago following army service in World War I, served as foreman, department foreman, division foreman, and then assistant superintendent at the company's Buitenzorg, Java, tire plant, where he was made superintendent in 1935. When the Japs overran the country, he was on leave in the United States and became superintendent of the rubberized products division of the Akron factory. Previous to his assignment as superintendent at Topeka he had served in similar capacity at the company's Akron plant.

Mr. Spencer recently returned to the Goodyear organization after a three-year tour of duty with the government. His most recent government assignment was deputy director of the WPB Rubber Bureau. He has had 19 years service with Goodyear in production, production control, and the administrative offices.

H. C. Hoch, chief engineer at the Hoosier Ordnance Plant near Louisville, Ky., has been transferred as manager of the newly opened Mississippi Ordnance Plant, Jackson, Miss., to be operated as a supplement to Hoosier plant. Both plants are operated by the Goodyear Engineering Corp., a subsidiary of The Goodyear Tire & Rubber Co. Others transferred to the Mississippi plant from the Hoosier plant include J. E. Norton, works accountant; T. Kerr, manager of production planning and transportation; D. C. Morrow, superintendent of inert stores and powder storage; H. B. Hale, chief engineer; R. J. Brown, safety engineer; W. Couger, superintendent of smokeless powder loading; G. C. Mayer, superintendent of the technical division; W. Morgan, manager of property and traffic; G. O. LaComte, chief of the guards and of the fire department; H. E. Brunner, purchasing agent; and L. O. Mayer, supervisor.

L. S. Hall, superintendent of the Goodyear Clearwater Mills plant at Rockmart, Ga., since 1936, has retired. His successor is E. A. Powell, assistant superintendent. Mr. Hall started with Goodyear Tire in January, 1920, at the fabric mill in Los Angeles, Calif. Subsequently, he was superintendent for 12 years of the Goodyear fabric mill in New Bedford, Mass. After joining Goodyear in 1929 in the Goodyear fabrics plant at Cartersville, Ga., Mr. Powell was transferred to the Rockmart plant as assistant superintendent in the same year.

Reorganization of the functions formerly included in the operation of the Goodyear retail stores division were announced last month by J. E. Mayl, vice president and sales manager of the tire division, following the resignation of D. R. Mackenroth, manager of retail stores division. Because of the growing importance of associated lines with dealers and stores, the buying, displaying, and merchandising of all such products have been assembled in one division.

H. G. Harper, Jr., as manager of associated merchandise, will direct the buying and merchandising of car and home merchandise and batteries and brake linings and will supervise budget sales and store planning and display.

O. E. Miles, manager of the Los Angeles district, as manager retail stores, will have charge of the operation of the Goodyear Service stores, including tire treading, petroleum products, and service equipment. C. W. Thorp, manager of the Sacramento district, succeeds the Los Angeles district succeeding Mr. Miles at Los Angeles and in turn is succeeded at Sacramento by J. K. Wright, recently appointed assistant district manager at Los Angeles.

Managers of Goodyear's five divisional tire sales offices are now headquartered in their territories, instead of in Akron: L. H. Shepherd, southeast division manager, at Atlanta; F. W. McConky, Jr., northeast division, New York, N. Y.; A. Jae Sears, northcentral division, Chicago; E. L. Mefford, western division, Los Angeles; and James A. Bailey, southcentral division, Dallas. Assistants with the division managers are: L. A. Moffett, Los Angeles; O. S. Whitaker, Dallas; R. E. Van Akin, New York; Joseph Stonecypher, Atlanta; E. C. Flinn, Chicago. Personnel men have also been assigned to the tire sales divisional offices. L. C. Buxton continues at Los Angeles; C. C. Bowser goes to Dallas; F. W. Lewis, New York; R. H. Donaldson, Atlanta, and A. S. Pratt, Chicago.

After several years in the U. S. Army, Joseph Nieberding has returned to the Goodyear company as a field representative in Chicago for the mechanical goods division. He was with Goodyear more than 15 years before being commissioned in the Army.

Harold Murtaugh, whom Mr. Nieberding replaces in Chicago, was transferred to the St. Louis district as mechanical goods field representative at Harrisburg, Ill. Formerly a clerk in the Chicago office and in merchandise distribution in Akron, Mr. Murtaugh has been with Goodyear about 10 years.

W. C. Breidenthal, who started with Goodyear's mechanical goods division in Akron in June, 1942, in office training, and who became a junior staff man in the belt department, was appointed a mechanical goods field representative in Knoxville, Tenn.

The Eagle-Picher Lead Co., American Bldg., Cincinnati, has acquired the production and distribution facilities of Southern Lead Co., Dallas, Tex. Products of this plant will be sold under the Eagle-Picher name, but the personnel of Southern Lead Co. will be retained. J. V. Murph will serve as general manager of the Dallas plant; D. Bentley Murph will be in charge of production at that plant, and D. H. Murph, founder, will remain in a consulting capacity. Operations will be conducted under the newly created firm name, Eagle-Picher Co. of Texas, with the three Messrs. Murph as vice presidents.

Pharis Tire & Rubber Co., Newark, has appointed R. R. Coleman assistant to Chief Chemist Gene Laughlin and John Breeding assistant to Vance Firestone, plant engineer. Previously Mr. Coleman had been with St. Clair Rubber Co., Acadia Synthetic Rubber Co., and Inland Tire & Rubber Co. Mr. Breeding, formerly a designing engineer with the Fostoria Steel Corp., had also been associated with the Master Tire & Rubber Co.

The Sun Rubber Co., Barberton, manufacturer of rubber toys, office, surgical specialties, and miscellaneous molded rubber products, took top safety honors among the city's industries in 1944, with fewer accidents and less man-hours lost in proportion to its number of employes than any other participant in the city's annual industrial safety campaign. Credit for Sun's achievement is due equally to the company's management and employes, Sun's personnel supervisor, W. C. Runstrom, said at a dinner of the company's industrial safety committees to lay plans for repeating in 1945 their outstanding record.

Sewell Before Akron Group

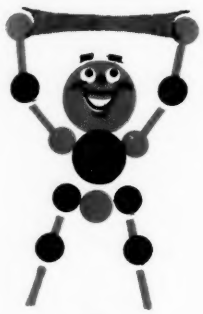
LUKE SEWELL, manager of the St. Louis Browns baseball club, who recently returned from a USO tour of the China-Burma theater of operations, addressed the winter meeting of the Akron Rubber Group on February 16 at the Mayflower Hotel. His talk, preceded by dinner, concerned itself with his experiences on his recent trip. A detailed description and impressions of various countries were given. The speaker, in addition, described railway transportation in upper India and the engineering difficulties encountered in building the Ledo Road. The movies, "Highballing to Victory" and "Communique 14", followed Mr. Sewell's talk. Attendance at the meeting totaled 249 members and guests.

New Softener for Light-Colored Synthetics

AFTER testing equal in almost every respect to the parent compound, Para Lene-W, a light-colored plasticizer and softener for synthetic rubber, is now in production. Its primary use is in light-colored GR-S stocks and in non-staining black stocks. Both Para Lene and Para Lene-W do not affect the rate of cure of GR-S to any extent.

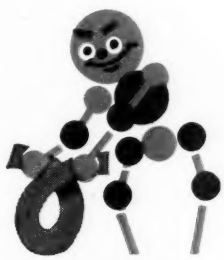
Tentative specifications are: acid and iodine numbers less than 20, ash less than ½ of 1%, less than 1% soluble in acetone, flash point above 350° F., and pour point below 70° F. This softener and plasticizer is being manufactured by The C. P. Hall Co., Akron, O.

IF YOU NEED A COMPOUND TO LICK BOTH HEAT AND COLD... Here is a formula, which, after 70 hours of oven aging at 300 degrees F., had the following properties...



Tensile
1300 psi

Shore Durometer increase
10 points



180 Degree Bend Test
No Cracking

SAE-ASTM Low Temperature Bend Test 5 hours in Cold Air! O.K. at —60° F.

Typical Results Under Controlled Conditions

Perbunan		100.0
Zinc Oxide		5.0
Stearic Acid		1.0
Trimethyl dihydroquinoline type antioxidant*		3.0
Dibenzyl Sebacate		10.0
Protective Wax**		2.5
Semi Reinforcing Furnace Black		50.0
Tetra Methyl Thiuram Disulfide		3.0
Mercaptobenzothiazole		3.0
Original Physical Properties Cured 45 minutes at 287° F.		
Tensile psi		1870
Elongation at break percent		930
Shore Durometer hardness		51
Compression Set ASTM 30% Constant Deflection		
70 hours at 212° F.		32%
70 hours at 250° F.		43%
Oven Aging 70 hours at	250° F.	300° F.
Tensile psi	2055	1300
Elongation at break percent	520	110
Shore Durometer Points change	+4	+10
Heat Loss percent	2.9	4.4
180° Bend Test	no cracking	no cracking
Low Temperature Properties		
SAE-ASTM Low Temperature Bend Test 5 hours in Cold Air.		O.K. at —60° F.

*Agerite Resin D; Santoflex B
**Sun Proof; Heliozone; Antisol

IMPORTANT! Your *Perbunan Compounding and Processing Manual* has the answer to most any problem you have. You'll save time and trouble if you'll cultivate the habit of consulting your manual whenever you need an answer. Drop us a line or phone if you haven't received your copy.

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THE SYNTHETIC RUBBER THAT RESISTS OIL, COLD, HEAT AND TIME

Patents and Trade Marks

APPLICATION

United States

2,368,674. **Sectional Platen Roll for a Writing or Imprinting Machine.** A. W. Metzner, assignor to Standard Register Co., both of Dayton, O.

2,368,689. **Open-Mesh Screen of Metallic Wire Coated with a Thermally Workable Synthetic Resin of Substantial Thickness.** H. W. Thomas, Miami Beach, Fla.

2,368,717. **A Pressure Mold Including a Metal Female Die Member and a Male Die Member with a Rigid Top Section, a Rigid Bottom Section of Plastic, and a Rubber Section Interposed between and Vulcanized to the Top and Bottom Sections.** C. F. Marschner, Normandy, assignor to McDonnell Aircraft Corp., St. Louis, both in Mo.

2,368,887. **Valve Member with Metal Core on Which Is a Molded Body of Plastic.** C. J. Schuler, Los Angeles, Calif., assignor to Interstate Aircraft & Engineering Corp., a corporation of Calif.

2,368,935. **In a Chamber Door Construction, Yieldable Resilient Gaskets Surrounding the Opening of the Chamber and the Panels in the Door Frame.** E. Lodwig, Franklin Square, assignor to Mobile Refrigeration, Inc., New York, both in N. Y.

2,368,968. **Solution of a Condensation Product of Higher Fatty Acids with Polyalkylene Polyamines to Float Silica from a Non-Metallic Ore.** L. J. Christmann, Yonkers, assignor to American Cyanamid Co., New York, both in N. Y.

2,368,974. **A Pneumatic Tire Including a Casing having a Flexible External Carcass Wall Embodying Inner and Outer Covers Secured together at Spaced Points, and between the Covers, Spaced, Annular Resilient Tubular Cushioning Elements of Elastic Fiber.** A. E. Dietz, Washington, D. C.

2,369,016. **Resilient Tire and Wheel.** L. Campagnano, Rockaway Park, N. Y.

2,369,077. **Rubber Members in a Vibration-Damping Suspension.** H. J. Seidel, Berlin-Wolmersdorf, and A. Weiler, Berlin-Spandau, both in Germany; vested in the Alien Property Custodian.

2,369,130. **Vehicle Traction Tread of Rubber-Like Material.** A. F. Benson, Springfield, Mass.

2,369,169. **A Fair Lead Including Members Connected with Rubber-Like Material.** P. J. Mochel, Los Angeles, Calif., assignor to Chrysler Corp., Highland Park, Mich.

2,369,229. **Detachable Garment Shield.** J. Hamlin, Cold Spring Harbor, N. Y.

2,369,395. **Yarn Structure Including a Plurality of Filaments of a Polyvinyl Resin.** K. Heymann, Meadville, Pa., assignor to American Viscose Corp., Wilmington, Del.

2,369,544. **Foot Massaging Device with a Resilient Elastic Roller.** T. A. Dolan, Chicago, Ill.

2,369,635. **For Spinning Rolls, a Cot Having an Innermost Layer of Resilient Rubber-Like Material, a Strength Layer, and an Outer Cover of Rubber-Like Material Harder Than the Innermost Layer.** H. M. Bacon, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,369,643. **Press Pad to Shape and/or Shear Sheet Material over a Die Which Includes a Facing Layer of Resilient Rubber, a Backing Layer, and Resilient Rubber Fastening Means.** J. L. Berger, Columbia, assignor to Armstrong Cork Co., Lancaster, both in Pa.

2,369,661. **Inflatable Body in a Device for Direct Testing of the Resistance to Run Formation of Stockings.** C. Dangelmajer, Nutley, N. J.

2,369,699-2,369,704. **Wringer.** C. B. Williams, Shaker Heights, assignor to Automatic Safety Wringer Co., Cleveland, both in O.

2,369,708. **Spindle Moistener Pad with a Back Portion of Pliable Rubber-Like Material.** D. B. Baker, Riverside, J. C. Holub, Chicago, and L. E. Nickla, Cicero, all in Ill., assignors to International Harvester Co., a corporation of N. J.

2,369,736. **Pneumatic Mattress.** V. H. Hurt, Cranston, R. I., assignor to United States Rubber Co., New York, N. Y.

2,369,768. **Demountable Tire Tread.** C. A. Ash, Milford, Mich.

2,369,880. **Spray Tube Attachment for Dental Instruments.** L. Bailenson, Brooklyn, N. Y.

2,369,886. **De-Icer Including a Rubber-Like Covering Having a Plurality of Cavities into Which a Liquid Is Intermittently Fed under High Pressure, Whereby Limited Deformation of the Cover about Each Cavity Is Formed.** J. G. L. Duval, Saint-Cyr-sur-Mer, France, assignor to Olaer Patent Co., New York, N. Y.

2,369,921. **Fuel Container with Walls of Flexible, Non-Metallic Sheet Material Impervious to Liquid Fuel.** L. Shakesby, Wolverhampton, assignor to Imperial Chemical Industries, Ltd., London, both in England.

2,369,927. **Tubular Knit Fabric Incorporating Elastic Thread.** P. L. Thurston and D. Nagley, both of Martinsburg, W. Va., assignors to Interwoven Stocking Co., New Brunswick, N. J.

2,369,984. **Blocks of Flexible Elastic Material in a Plow Hitch.** A. E. Rutter, Rockford, Ill., assignor to J. I. Case Co., Racine, Wis.

2,370,028. **Hardenable Resinous Composition for Decorating a Fibrous Surface.** H. Freiberg, assignor of one-half to S. Freiberg, both of London, England.

2,370,046. **Resinous Composition of an Oil-Modified Alkyd Resin, Phenol-Formaldehyde, and Hydrolyzed Polyvinyl Ester in an Insulated Conductor.** J. J. Keyes, Edgewood, Pa., assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, both in Pa.

2,370,069. **Inflatable Boat.** F. F. Patten, Woonsocket, R. I., assignor to United States Rubber Co., New York, N. Y.

2,370,090. **Super-Calendered Kraft Paper Skin-Coated with a Moistureproof Coating Deposited from a Solvent.** H. R. Thies, Kent, and C. M. Carson, Cuyahoga Falls, assignors to Wingfoot Corp., Akron, all in O.

2,370,115. **In a Valve, Resilient Sealing Ring and Conical Yieldable Resilient Sealing Gasket.** M. R. Rice, Jackson, Miss.

2,370,170. **Body Molding Garment, Having Elastic Sections.** H. L. Jasper, Bridgeport, Conn.

2,370,193. **Double-Walled, Fibrous Conduit Including Two Paper Tubes Secured Together by a Film of Adhesive, and Impregnated with a Thermoplastic, Water-Resistant Material.** E. S. Reid, Charlotte, N. C., assignor to Sonoco Products Co., a corporation of S. C.

2,370,263. **Projection Screen Having as Base a Transparent Plastic Sheet.** E. Schweitzer, East Orange, N. J., assignor to Celanese Corp. of America, a corporation of Del.

2,370,322. **Apparatus for Shaping Materials, Including a Portable Platform Adapted to Receive a Forming Mandrel, an Impervious Blanket, and Means for Securing the Blanket to the Platform; These Means Include an Inflatable Tube Formed at the Free Edge of the Blanket.** R. J. Nebesar, assignor to Universal Moulded Products Corp., both of Bristol, Va.

2,370,323. **In a Rotary Surfacing Machine, a Pad in the Form of a Disk of Substantial Thickness Made of a Tough Flexible Elastomer.** L. A. Patt, Niagara Falls, Ont., Canada, assignor to Carborundum Co., Niagara Falls, N. Y.

2,370,360. **Pressure Fluid Clutch Including a Disk-Like Inflatable Air-Tight Compression Chamber with a Flexible Wall.** I. O. McLean and F. L. White, assignors to Osgood Co., all of Marion, O.

2,370,376. **Windshield Wiper.** S. A. Snell, assignor by mesne assignments to Ryerson & Haynes, Inc., both of Jackson, Mich.

2,370,379. **In an Apertured Facing Adapted to Support a Sound-Absorbing Member above It, the Improvement That the Facing Is of a Resinous-Base Material.** A. F. Trippensee, Riverside, Ill.

2,370,391. **Split Ring of Elastic Plastic Material to Prevent Withdrawal of the Shank of the Hook from the Body of a Non-Metallic Garment Hanger.** J. Bolten, Andover, Mass., and H. Spitz, Great Neck, N. Y.

2,370,401. **Collapsible Boat.** F. B. S. Grimston, Farnham Royal, England.

2,370,419. **Non-Metallic, Gasproof Container for Foodstuffs, Medical Supplies, Etc., Having a Heat-Sealing Inner Surface Portion, a Thin Layer of Polyvinyl Alcohol Composition, and an Outer Layer of Nylon.** D. Ray, Beverly Hills, Calif.

2,370,433. **Faucet Attachment of Rubber.** F. B. Williams, Columbus, O.

2,370,442. **Lady's Hat Having a Visible Band of Elastic Joining Crown and Brim and Extending below the Brim to Form a Headband.** H. Bantley, New York, N. Y.

Dominion of Canada

425,146. **Looper Mechanism for a Sewing Machine, Having an Arm Mounted by Means of a Flexible Sleeve of Rubber or the Like.** L. M. Bellamy, Caterham, Surrey, and R. H. Sheepshanks, Woodbridge, Suffolk, both in England.

425,188. **Fire Fighting Apparatus Including a Self-Propelled, Wheeled Body.** Cardox Corp., asignee of E. Geertz, both of Chicago, Ill., U. S. A.

425,194. **Tough Resilient Insulating Bat of Mineral Wool Fibers Bonded with a Thermosetting Condensation Product.** Fiberglas Canada, Ltd., Oshawa, Ont., assignee of Owens-Corning Fiberglas Corp., Toledo, assignee of W. M. Bergin, and A. L. Simison, both of Newark, both in O., U.S.A.

425,202. **Vibration Dampener Having a Plate Member, a Spider Member, and a Body of Yieldable Rubber Forming a Resilient Connection between the Members.** Harris Products Co., Cleveland, assignee of H. A. Storch, Fairview Village, both in O., U.S.A.

425,230. **Joint for Metal Sheath Cables, Including a Cable Splice, a Metal Sleeve, and Resilient Bushings at Each End of the Sleeve.** Western Electric Co., Inc., assignee of Bell Telephone Laboratories, Inc., both of New York, N. Y., assignee of W. C. Kleinfelder, Summit, N. J., both in the U. S. A.

425,270. **Hose Coupling Including a Rigid Hollow Shell with Two Open Ends, a Pair of Spigot Members, Each Having One Extremity Adapted for Attachment to a Pipe or Hose End, and the Other Extremity of Resilient Material Capable of Being Collapsed by External Pressure to Be Inserted into the Shell.** F. E. Smith, South Dartmouth, Mass., U. S. A.

425,279. **Shoe Sole Press Including a Frame Having a Base Portion, and an Inflatable Bladder on the Base for Engaging the Surface of an Outer Sole.** Allied Shoe Machinery Corp., Haverhill, assignee of A. Perri, Groveland, both in Mass., U. S. A.

425,285. **De-Icing System Equipped with Inflatable Rubber Tubes.** Bendix Aviation Corp., Bendix, assignee of D. M. Lawrence, Caldwell, both in N. J., U. S. A.

425,319. **Vibration Dampener Having a Pair of Coaxially Disposed Members with Intermeshing Arms Portions and a Resilient Rubber Ring Engaging These Arms Portions and Forming a Yieldable Connection between the Members.** Harris Products Co., Cleveland, assignee of H. A. Storch, Fairview Village, both in O., U. S. A.

425,323. **Composite Structure of Wood Laminae Treated with Thermoplastic Resin.** Hordern-Richmond Aircraft, Ltd., Aerodrome Haddenham, assignee of A.A.D. Lang, Gerrards Cross, both in Buckingham, England.

425,329. **Felt of Mineral Wool Fibers and a Thermoplastic Binder.** Johns-Manville Corp., New York, N. Y., assignee of H. T. Coss and J. H. Zettel, both of Somerville, and L. A. Hawthorne, Hillside, both in N. J., both in the U. S. A.

425,330. **Felt of Mineral Wool Fibers and a Thermoplastic Binder.** Johns-Manville Corp., New York, N. Y., assignee of H. T. Coss and W. M. MacAlpine, both of Somerville, and L. A. Hawthorne, Hillside, both in N. J., both in the U. S. A.

425,331. **Felt of Mineral Wool Fibers and a Thermoplastic Binder.** Johns-Manville Corp., New York, N. Y., assignee of H. T. Coss, Somerville, N J., both in the U. S. A.

425,360 **In a Coupling, Rubber Blocks Arranged in Recesses of a Pair of Spaced Parallel Torque Transmitting Members.** Thompson Products, Inc., Cleveland, O., assignee of A. Venditty, Detroit, Mich., both in the U. S. A.

425,361. **Flexible Coupling.** Thompson Products, Inc., Cleveland, O., assignee of A. Venditty, Detroit, Mich., both in the U. S. A.

425,362. **In a Universal Joint Having Opposed Coupling Members, a Torque Transmiting Member Connecting the Coupling Members with the Aid of Rubber Bushings.** Thompson Products, Inc., Cleveland, O., assignee of A. Venditty, Detroit, Mich., both in the U. S. A.

425,389. **A Centrifugal Clutch Including a Driving Hub, a Circumferential Series of Rigid Centrifugal Members, and between Hub and Members a Series of Torque Transmitting Bodies of Resiliently Deformable Material.** T. L. Fawick, Akron, O., U. S. A.

425,496. **De-Icer for a Propeller-Blade having Rounded Leading Edge, Consisting of an Electrical Heating Unit Including a Flexible, Non-Metallic Sheet Having a Flexible Plastic Binding Material Containing Carbon Black, Sufficient to Impart Conducting and Heating Properties, and having Conducting Wires.** United States Rubber Co., New York, N. Y., assignee of L. Maridk, Grosse Pointe Farms, Mich., U. S. A.

425,497. **Mold with a Rubber Mold Face and a Metal Backing.** United States Rubber Co., New York, N. Y., assignee of E. H. Wallace, Detroit, Mich., both in the U. S. A.

425,518. **Protective Sheath Having Thin, Flexible, Elastic, and Resilient Walls.** E. T. Wyman, Brookline, assignee of E. F. Bowman, Boston, both in Mass., U. S. A.

425,528. **Tire and Wheel Assembly.** J. A. R. Granier, Montreal, P. Q.

425,535. **Package for Coffee, Etc., Consisting of a Bag with an Outer Ply of Paper, and Intermediate Ply of Rubber, and Individual Bags of Greaseproof Material Arranged within Inner and Outer Plies.** H. F. Waters, New York, N. Y., U. S. A.

425,590. **In a Universal Joint a Hollow Joint Member, an Outer Housing around It, and between It and the Outer Housing a Resilient Vibration Absorbing Member of Rubber.** Thomp-

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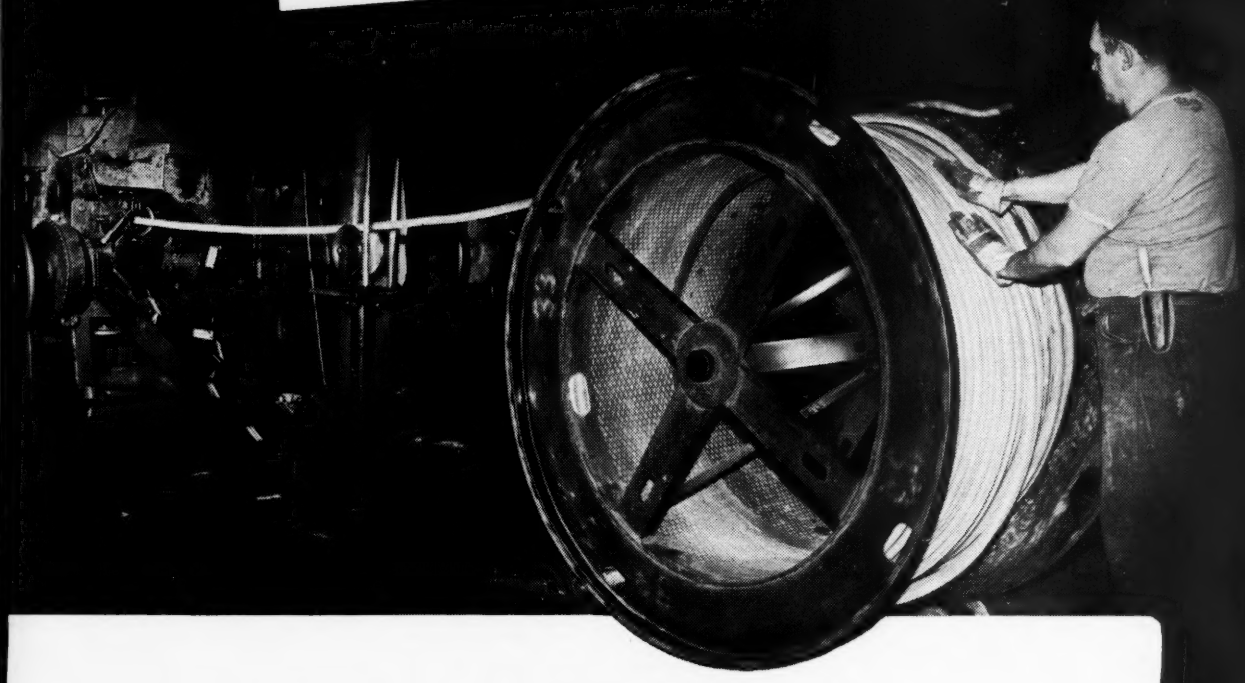

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son Products, Inc., assignee of J. R. Snyder, both of Cleveland, O., U. S. A.

425,593. **Filter Sheet of Perforated Rubber to Which Is Secured by Means of Rubber Adhesive a Sheet of Open-Mesh Fabric.** United States Rubber Co., New York, N. Y., assignee of H. F. Jordan and G. E. Shriver, both of Nutley, N. J., both in the U. S. A.

425,599. **Hardenable Synthetic Resin for Decorating Fibrous Surfaces.** H. and S. Freiberg, both of London, England, assignee of one-half interest of H. Freiberg.

425,602. **Polymer of a Derivative of Vinyl Alcohol, Acrylic Acid, or Methacrylic Acid as Coating for Pile Fabrics.** H. Dreyfus, London, assignee of W. I. Taylor and J. F. Levers, both of Spondon, both in England.

425,620-425,621. **Wringer for Washing Machines.** N. L. Elten, Waterloo, Iowa, U. S. A.

425,631. **Non-Skid Tire.** Firestone Tire & Rubber Co., assignee of J. J. Robson, both of Akron, O., U. S. A.

425,640. **Resilient Pads in Cushioning Means for a Railway Car Truck.** American Steel Foundries, assignee of J. E. Flesch, both of Chicago, Ill., U. S. A.

425,662. **A Rotary Inertia Operated Control Device to Detect the Rate of Change of Speed of a Rotary Element; The Device Includes a Hub Element, an Annular Inertia Member, and an Annular Web Member of Resilient Rubber-Like Material Secured to the Hub Element and the Inertia Member.** Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of G. K. Newell, near Pitcairn, Pa., U. S. A.

425,688. **Tire.** Firestone Tire & Rubber Co., assignee of J. E. Hale, both of Akron, O., U. S. A.

425,735. **Pneumatic Tire Casing.** United States Rubber Co., New York, N. Y., assignee of E. S. Ebers, Nutley, N. J., both in the U. S. A.

425,746. **Resilient Mounting, Including a Rubber Cushion, for Parts of a Mechanically Propelled Vehicle or Other Machinery.** C. Macbeth, Birmingham, and V. G. Loyd, Camberley, Surrey, both in England.

425,755. **Shatterproof Plastics.** C. Dreyfus, New York, N. Y., assignee of B. Anderson and E. Schweizer, both of Newark, N. J., U. S. A.

United Kingdom

566,220. **Platens or Rollers for Writing Machines, Etc.** W. P. Williams, Standard Register Co.

566,301. **Universal Joints.** S. G. Wingquist.

566,329. **Flexible Packings or Sealing Rings.** Tecalemit, Ltd., and C. C. S. Le Clair.

566,381. **Resilient Mountings.** Rubber Bonders, Ltd., C. Whittingham, and N. Beck.

566,409. **Lifesaving Device.** W. E. Hutton and A. W. H. Ward.

566,425. **Insulating Sleeves and Bushings for Electric Conductors.** C. J. Beaver, E. L. Davey, J. H. Pirie, and Glover & Co., Ltd.

566,467. **Gaskets.** C. H. Yates.

566,501. **Pneumatic Tire and Rim.** H. J. Waller and L. S. Ffitch-Hayes.

566,696. **Fluid Pressure Devices to Control the Firing of Automatic Guns.** Dunlop Rubber Co., Ltd., and H. W. Trevaskis.

566,714. **Windscreen Wipers.** Trico Products Corp.

566,860. **Rubber Flooring.** Wingfoot Corp.

566,951. **Brake, Clutch, and Like Mechanism, and Devices for Use therewith.** Dunlop Rubber Co., Ltd., and H. J. Butler.

PROCESS

United States

2,368,645. **Fabricating Containers from Blanks of Rubber Hydrochloride Material.** O. J. De Silva, assignor to Shellmar Products Co., both of Mount Vernon, O.

2,368,828. **Carbon Black.** H. Hanson, Charleston, W. Va., and R. W. Skoog, Borger, Tex., assignors to United Carbon Co., Inc., Charleston, W. Va.

2,369,636. **Molding Loop Pickers.** H. M. Bacon, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

Dominion of Canada

425,736. **Open Elastic Network of Rubber.** United States Rubber Co., New York, N. Y., assignee of T. G. Hawley, Jr., and A. H. Dorazio, both of Naugatuck, Conn., both in the U. S. A.

United Kingdom

566,395. **Hot Water Bottles.** T. W. Holt.

566,474. **Articles from Plastic Sheets.** Briggs Mfg. Co.

566,745. **Coating the Interiors of Hollow Articles with Polythene Compositions.** G. W. Worrall and Imperial Chemical Industries, Ltd.

566,837. **Molded Articles from Molding Powders.** Hornflowa, Ltd., and H. A. M. Winter.

CHEMICAL

United States

2,368,764. **In Making Cellulose Mixed Esters, the Step of Reacting Cellulose, Acetic Acid, Acetic Anhydride, Another Fatty Acid Anhydride, a Chloro-Fluoro-Hydrocarbon having a Boiling Point Below 50° C. and a Suitable Catalyst.** B. T. Lamborn, Matawan, N. J., assignor to Hercules Powder Co., Wilmington, Del.

2,368,782. **Textile Fabric Finishing Composition Having as a Binding Agent Starch Modified with a Polymerized Terpene Hydrocarbon Resin.** A. L. Rummelsburg, assignor to Hercules Powder Co., both in Wilmington, Del.

2,368,788. **A Substantially Dry Molding Composition including Cellulose Acetate, a Petroleum-Hydrocarbon Insoluble Pine Wood Resin, and a Plasticizer.** J. S. Tinsley, assignor to Hercules Powder Co., both of Wilmington, Del.

2,368,807. **A Pitch Base Rubber Compounding Material Dispersible in Rubber at Temperatures below 150° F., including Pitch, a High Molecular Weight Aliphatic Softening Agent, and an Aromatic Oil.** A. B. Cowdary, Harwich Port, Mass., assignor to Allied Chemical & Dye Corp., New York, N. Y.

2,368,841. **Producing Sulphonyl Guanylureas by Hydrolyzing a Substance of the Group of Aliphatic Sulphonyl Dicyandiamides and Aromatic Sulphonyl Dicyandiamides by Subjecting to Heat in the Presence of an Aqueous Acidic Solution at a Temperature below the Decomposition Point of the Sulphonyl Guanylurea Produced.** D. W. Kaiser and J. T. Thurston, both of Riverside, Conn., assignors to American Cyanamid Co., New York, N. Y.

2,368,903. **Alkali-Metal ω-Cyanoguanidodithiocarbonates.** J. T. Thurston and D. W. Kaiser, both of Riverside, Conn., assignors to American Cyanamid Co., New York, N. Y.

2,368,948. **Preparing a Novel Fabric by Sizing Multifilament Yarn with an Aqueous Dispersion of a Copolymer of an Acrylic Acid Ester and Acrylonitrile, Making a Fabric with the Sized Yarn, Wetting the Fabric with Water, and Then Drying by Heating Above the Fluxing Point of the Resin without Subjecting the Resin-Impregnated Yarn to Tension.** J. W. Stallings, Haddon Heights, N. Y., assignor to Rohm & Haas Co., Philadelphia, Pa.

2,368,949. **In Preparing Water Soluble Saponification Products of Polyvinyl Esters Free from Impurities that Break Emulsions or Dispersions, the Step of Treating an Aqueous Solution of the Saponification Product with Activated Charcoal.** J. E. Smith, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,369,057. **Treating a Shaped Mass of Polymerized Methyl Methacrylate, Containing Voids, by Subjecting to a Temperature of about 140° C. and to a Pressure of about 3,000 Pounds per Square Inch While the Mass Is Immersed in an Aqueous Solution of about 3.5 Molar Strength of Sodium Acetate.** R. E. Leary, Newark, and B. M. Marks, Upper Montclair, both in N. J., assignors to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del

2,369,061 **Preparing Adiponitrile from a Half Alkyl Eser of Adipic Acid.** D. J. Loder and W. M. Bruner, assignors to E. I. du Pont de Nemours & Co., Inc., all of Wilmington, Del.

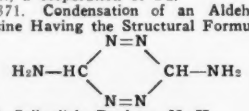
2,369,109. **Refining a Polymerized Rosin Ester.** A. L. Rummerlsburg, assignor to Hercules Powder Co., both of Wilmington, Del.

2,369,117. **Producing Dichlorobutenes by Dissolving Butadiene in One Portion of Inert Solvent, Dissolving Chlorine in an Amount Insufficient for Complete Addition Reaction in Anothtr Portion of Inert Solvent, and Mixing the Solutions.** A. S. Carter, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,369,125. **Rosin Ester of High Oxygen Resistance.** G. R. Anderson, Elsmere, assignor to Hercules Powder Co., Wilmington, both in Del.

2,369,281. **Production of Valuable Unsaturated Resin-Forming Hydrocarbon Material by Vapor Phase Pyrolysis of Petroleum Oil.** N. K. Chaney, Moylan, Pa., assignor to United Gas Improvement Co., a corporation of Pa.

2,369,371. **Condensation of an Aldehyde and a Tetrazine Having the Structural Formula**



J. K. H. Seiberlich, Durham, N. H.

2,369,379. **Composition of Matter Including Ethyl Cellulose and a Resin from the Group of Cativo Resin and Copaiba Resin.** N. E. Tillotson, Watertown, Mass.

2,369,434. **Tough and Coherent Vulcanized Body from Fatty Acid Triglycerides and an Oil Soluble Thermoplastic Resin; This Body Is Insoluble in Evaporative Hydrocarbon Solvents Having a Kauri-Butanol Value no Greater Than 28.5, and Soluble When the Kauri-Butanol Value Is over 50.** J. W. Church, Mount Lebanon, assignor to Falk & Co., Carnegie, both in Pa.

2,369,439. **Product Obtained by Reacting a Protein with the Reaction Product of Formaldehyde and a Salt of Sulphamic Acid.** M. E. Cupery, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,369,471. **Raising the Softening Point, Increasing the Notch-Bend Resistance, and Improving the Flexibility of a Polymer of Ethylene by Blending with It a Polymer from the Class of Hydrocarbon and Halogenated Hydrocarbon Polymers of the Group of Butadiene and Isoprene Polymers, Polyisobutylene Halogenated Ethylene Polymers, Polymerized Chloro-2-Butadiene-1,3, Chlorinated and Hydrochlorinated Rubber, Hydrogenated Rubber, Balata, Gutta Percha.** G. H. Latham, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,369,504. **Solid Polymer of Formaldehyde.** J. F. Walker, Lewiston, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,369,520. **Polymerizing a Monomeric Compound from a Group of Lower Alkyl Esters of Acrylic Acid and Methacrylic Acid to Form a Solid Object.** C. E. Barnes, Worcester, Mass., assignor by mesne assignments to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,369,593. **Cast Sheets from a Heat-Polymerizable Liquid Capable of Forming a Substantially Rigid Polymer.** B. M. Marks, Newark, N. J., and C. E. Ranck, Philadelphia, Pa., assignors to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,369,612. **As a New Chemical Compound, the Chloro-Acetaldehyde-Dioctyl-Mercaptal.** E. Schirm, Dessau, Anhalt, Germany; vested in the Alien Property Custodian.

2,369,657. **Thioketones.** L. G. S. Booker and G. H. Keyes, assignors to Eastman Kodak Co., all of Rochester, N. Y.

2,369,683. **Preparing Resinous Material by Heating together a Mixture of Monoglyceride Product with an Equimolecular Quantity of Maleic Anhydride, and Then Slowly Adding an Oil from the Drying and Semi-Drying Class.** C. G. Moore, River Forest, Ill., assignor to Glidden Co., Cleveland, O.

2,369,985. **Composition Including the Product of Conjoint Polymerization of Vinyl Halides and Vinyl Esters of the Lower Aliphatic Acids, and a Methyl Chlor Stearate having at Least Three Chlorine Atoms in the Molecule.** M. M. Safford, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,370,006. **Unsaturated Cyanoaldehydes.** H. A. Bruson and T. W. Reiner, assignors to Resinous Products & Chemical Co., all of Philadelphia, Pa.

2,370,010. **Method of Polymerization Which Consists of Treating a Mixture of Butadiene and a Monomer from the Group of Esters and Nitriles of Acrylic Acids in an Aqueous Medium Containing an Emulsifying Agent, an Oxidant, and from 0.5 to 3 Parts per Million of Copper in Solution.** A. M. Clifford, Stow, and W. D. Wolfe, Cuyahoga Falls, assignors to Wingfoot Corp., Akron, all in O.

2,370,044. **Quick Setting Tacky Cement Containing Purified Latex, a Curing Agent, a Sensitizing Agent (Ammonium Nitrate), and a Volatile Stabilizer (Dimethylamine).** K. L. Keene and E. G. Bargmeyer, assignors to Mishawaka Rubber & Woolen Mfg. Co., all of Mishawaka, Ind.

2,370,057. **For Finishing and Dressing Fibrous Materials, a Composition Consisting of an Aqueous Emulsion Containing a Tough, Dry, Elastic and Rubbery Polyisobutylene, a Cyclic Hydrocarbon Resin from the Group of the Resinous Polymers of Beta-Pinene and the Hydrogenated Coumarone Indene Resins, and Methyl Cellulose.** G. P. Mack, Jackson Heights, assignor to Advance Solvents & Chemical Corp., New York, both in N. Y.

2,370,064. **Separating Butadiene from a Mixture thereof with a More Saturated Hydrocarbon Having Four Carbon Atoms in the Molecule.** H. S. Nutting and L. H. Horsley, assignors to Dow Chemical Co., all of Midland, Mich.

2,370,124. **Producing Articles of Polymeric Vinyl Acetal by Forming an Article of Solid Polyvinyl Alcohol, Preheating with Catalyst in a Non-Solvent for Polyvinyl Alcohol, and Then Reacting in a Reaction Bath Containing a Monomeric Acetal.** J. Dahle, West Newton, assignor by mesne assignments to Pro-phy-lac-tic Brush Co., Northampton, both in Mass.

2,370,253. **Arylene Thiazyl Sulphenamides.** W. E. Messer, Cheshire, Conn., assignor to United States Rubber Co., New York, N. Y.

2,370,280. **Plastic Composition of Improved Impact Strength Consisting of an Intimate Solid**

up in the stratosphere

WITH FEET ON THE GROUND

Technicians in Monsanto's Rubber Research Laboratories, in Akron, Ohio, can take samples of rubber "into the stratosphere" without leaving the ground. They accomplish this by use of a sub-zero test box in which temperatures as low as –100°F. can be attained.

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During the more than twenty-five years that Monsanto's Akron laboratories have served the rubber industry, the staff of experts has been in the "stratosphere of research" many times in exploring for ways to make rubber more useful to mankind. But always this staff has had "its feet on the ground of experience." This willingness to explore, combined with practical knowledge of rubber, makes the laboratory's service extremely practical.

If you have a problem of wartime rubber compounding, you are welcome to submit it to the Monsanto Rubber research laboratories... without cost and without obligation. MONSANTO CHEMICAL COMPANY, Rubber Service Department, Second National Building, Akron 8, Ohio. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle, Montreal, Toronto.

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WETTING AGENTS

pact Strength Consisting of an Intimate Solid Dispersion of an Aluminum Hydrate with a Conjoint Polymer of Vinyl Chloride with Vinyl Acetate. V. Yngve, Lakewood, O., assignor to Carbide & Carbon Chemicals Corp., a corporation of N. Y.

2,370,346. Adding to Monomeric Styrene Containing Small Amounts of Oxidation Products of Styrene, a Small Quantity of an Amine, Reacting the Amine with the Oxidation Products, and Distilling to Recover Substantially Pure Styrene. E. W. Gluesenkamp, Centerville, O., assignor to Monsanto Chemical Co., a corporation of Del.

2,370,362. Producing a Laundry-Resistant Finish on Cloth by Impregnating with an Emulsion of the Oil-in-Water Type in Which the Continuous Phase Is an Aqueous Solution of an Emulsifying Agent and the Dispersed Phase Contains a Mixture of a Phthalic Glyceride Resin Having an Acid Number of 25-80 and a Melamine-Formaldehyde Resin. D. W. Light, Longmeadow, Mass., assignor to American Cyanamid Co., New York, N. Y.

2,370,405. Producing Water-Repellence in Textile or Other Material by Impregnating with an Isocyanate Containing a Radical from the Group of an Aliphatic and an Aliphatic-Aromatic Radical, Each Aliphatic Radical Containing a Hetero Radical and Having an Uninterrupted Carbon Chain of at Least 10 Carbon Atoms. W. Kaase, Reichenbach in Vogtland, and E. Waltmann, Krefeld, both in Germany, assignors to Heberlein Patent Corp., New York, N. Y.

2,370,412. Improved Process for Manufacturing Conjugated Diolefins. R. C. Morris and R. J. Moore, Berkeley, assignors to Shell Development Co., San Francisco, both in Calif.

2,370,457. As a Filler for Use in Making Rubber Products, Chrome-Tanned Leather Shavings Fat-Liquored to an Acetone-Extractable Content in the Range of 8% to about 15%, Then Dried and Dry-Milled to an Average Fiber Length of about 0.1 Mm. to about One Mm. W. S. Gocher, Fairfield, and A. J. Jennings, Bridgeport, both in Conn., and C. M. Langkammerer, assignors to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,370,512-2,370,513. Conjugated Diolefin. J. L. Amos, Midland, and F. J. Soderquist, Bay City, assignors to Dow Chemical Co., Midland, both in Mich.

2,370,517. Method of Insolubilization of Water-Soluble Cellulose Ethers Which Includes: Forming a Water Solution of the Cellulose Ether and a Water-Soluble, Heat-Hardenable Melamine-Aldehyde Resin Modified by Condensation with a Polyhydric Alcohol, Vaporizing the Water from the Solution, and Heating the Dry Composition Remaining. S. L. Bass, R. M. Upright, and F. L. Dennett, assignors to Dow Chemical Co., all of Midland, Mich.

2,370,549. Methyl Vinyl Carbonate. F. E. Kung, Akron, O., assignor to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,550. Water-Insoluble Thermoplastic Cellulose Ether in Preparing a Multi-Ply Stiffened Fabric. A. A. Lawrence, Port Chester, N. Y., and S. L. Bass, assignors to Dow Chemical Co., both of Midland, Mich.

2,370,562. Coated Resin Product. V. Meunier, Akron, O., assignor to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,565. Polymerized Ester of (a) a Polyglycol and (b) Acid Ester of an Unsaturated Alcohol and Carbonic Acid. I. E. Muskat and F. Strain, both of Akron, O., assignors to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,566. Polymer of a Diester of Carbonic Acid and a Lactic Acid Ester of an Unsaturated Alcohol. I. E. Muskat and F. Strain, both of Akron, O., assignors to Pitsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,567. Preparing an Ester of Carbonic Acid by Reacting an Unsaturated Haloformate with a Polyhydric Alcohol in the Presence of a Basic Reagent. I. E. Muskat and F. Strain, both of Akron, O., assignors to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,568. A Bis (Chloroformate) of a Polyglycol. I. E. Muskat and F. Strain, both of Akron, O., assignors to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,569. Polyglycol Bis (Unsaturated Alcohol Carbonate). I. E. Muskat and F. Strain, both of Akron, O., assignors to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,570. Methallyl Chloroformate. I. E. Muskat, Akron, O., assignor to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,571. Preparing Glycol Bis by Reacting a Glycol Bis Chloroformate with an Unsaturated Monohydric Alcohol. I. E. Muskat and F. Strain, both of Akron, O., assignors to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,572-2,370,574. Unsaturated Esters and Polymers thereof. I. E. Muskat, Akron, and F. Strain, Norton Center, both in O., assignors to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,578. Polymerizing Unsaturated Compounds. M. A. Pollack, Austin, Tex., and I. E. Muskat and F. Strain, both of Akron, O., assignors to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,370,589. Vinyl Alkenyl Carbonate Wherein the Alkenyl Group Contains an Olefinic Bond between the Second and Third Carbon Atoms from the Carbonate Linkage. F. Strain and F. E. Kung, both of Akron, O., assignors to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

Dominion of Canada

425,185. Making Aliphatic Dicarbonylic Compounds having up to Five Carbon Atoms and Hydrates, and Polymers of These Compounds by Catalytic, Vapor Phase, Oxidation. Carbide & Carbon Chemicals Ltd., Toronto, Ont., assignee of R. W. McNamee, South Charleston, and J. T. Dunn, Charleston, both of W. Va., U. S. A.

425,186. 1,2-Dicarbonylic Compound Having from Two to Three Carbon Atoms and Their Hydrates and Polymers. Carbide & Carbon Chemicals, Ltd., Toronto, Ont., assignee of R. W. McNamee, South Charleston, and J. T. Dunn, Charleston, both in W. Va., U. S. A.

425,192. Rubber Hydrochloride Composition Containing an Open-Chain Polyalkylene Polyamine Composed Solely of Alkylene and Amine Groups, and in Which the Terminal Groups Are Primary Amine Groups. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of G. E. Hulse, Jr., Passaic, N. J., U. S. A.

425,195. Hardening the Fibers of a Compressible Non-Metallic Propeller Blade Shank, the Fibers of Which Have First Been Impregnated with a Polymerizable Compound. Freedman-Burnham Enginering Corp., assignee of G. L. Freedman and W. E. Burnham, all of Cincinnati, O., U. S. A.

425,220. Finishing a Pile Fabric by Treating with an Alkaline Solution of an Alkali Soluble Water-Insoluble Cellulose Ether and an Alkali-Soluble Resin, Conjointly Coagulating the Resin and the Cellulose Ether on the Fabric, Thus Forming a Permanent Deposit Which Binds the Pile Tufts to the Fabric. Sylvania Industries Corp., Fredericksburg, Va., assignee of J. A. Clark, Port Chester, N. Y., both in the U. S. A.

425,235. Low-Melting Mixed Rubber Age-Resister Consisting of (1) an N,N'-Diphenyl-p-Phenylene Diamine, (2) a Secondary N-Phenyl-N-Naphthyl Monoamine, and (3) at Least One Secondary N-Phenyl-N-Aryl Monoamine Differing from Component (2). Wingfoot Corp., Akron, assignee of A. M. Clifford, Stow, both in O., U. S. A.

425,294. Heat-Hardenable Resinous Composition Produced by Reacting in the Presence of Monoamylamine a Mixture of a Cresol Composition, Formaldehyde, and a 50-50 Mixture of Castor Oil and Oiticcia Oil. Canadian General Electric Co., Ltd., Toronto, Ont., assignee of H. I. Hersh, Scotia, N. Y., U. S. A.

425,312. Chemically Resistant Gas-Expanded Cellular Product Having the Modulus and Elasticity of Soft Vulcanized Cellular Caoutchouc Rubber and Composed Essentially of Rubber Vulcanized to the Hard Rubber State and a Distinctly Elastic Polymer of a Purely Aliphatic Mono-Olefin. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. A. Gibbons, Montclair, N. J., U. S. A.

425,318. Beta-Alkoxy Monocarboxylic Acid. B. F. Goodrich Co., New York, N. Y., assignee of F. E. Kung, Akron, O., both in the U. S. A.

425,335. A Stable, Dry Adhesive Composition Consisting of a Water-Soluble Formaldehyde-Urea Reaction Product and a Substance from the Group of Magnesium Oxide, Magnesium Hydroxide, Zinc Oxide, and Zinc Hydroxide, Mixed with an Ammonium Salt of a Non-Volatile Strong Acid. Libbey-Owens-Ford Glass Co., assignee of Plaskon Co., Inc., assignee of W. C. Dearing, all of Toledo, O., U. S. A.

425,366. A Substantially Homogeneous Rubber Composition Containing Relatively Large Proportion of a Normally Heat-Flocculable Reenforcing Black in a Highly Deflocculated and Particulate State of Dispersion, and a Primary Amido Derivative of Carbonic Acid. United States Rubber Co., New York, N. Y., assignee of R. H. Gerke, Nutley, N. J., both in the U. S. A.

425,435. Production of Polymers of Styrene by Subjecting a Solution Containing 50% or More by Weight of an Inert Solvent, to the Action of at Least One Inorganic Material from the Group of an Activated Bleaching Earth, an Activated Clay, and Silica Gel. Distillers Co., Ltd., Edinburgh, Scotland, assignee of H. M. Stanley, Tadworth, and F. E. Salt, Banstead, both in Surrey England.

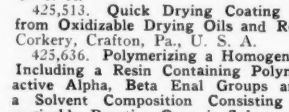
425,436. Production of a Styrene-Type Polymerization Product by Subjecting an Admixture of Styrene with Polymers thereof to Polymerizing Conditions in the Presence of an Ester of Crotonic Acid Having at Least Two Double Bonds in the Molecule Separated by at Least One Carbon Atom. Distillers Co., Ltd., Edinburgh, Scotland, assignee of H. P. Staudinger, Ewell, Surrey, England.

425,457. Stable, Dry Mixture Including a Hardenable Water-Soluble Formaldehyde-Urea Reaction Product, Ammonium Sulphate, and the Chloride of an Alkaline Earth Metal; This Mixture Forms a Self-Hardening Composition When Water Is Added. Libbey-Owens-Ford Glass Co., assignee of Plaskon Co., Inc., assignee of A. M. Howald and W. C. Dearing, all of Toledo, O., U. S. A.

425,513. Quick Drying Coating Compositions from Oxidizable Drying Oils and Resins. F. W. Corkery, Crafton, Pa., U. S. A.

425,636. Polymerizing a Homogeneous Mixture Including a Resin Containing Polymerizably Reactive Alpha, Beta Enal Groups and Including a Solvent Composition Consisting of a Polymerizably Reactive Organic Substance Containing the Group $CH_2=C<$, in the Presence of a Polymerization Catalyst and a Polymerization Inhibitor. American Cyanamid Co., New York, N. Y., assignee of E. L. Kropa, Stamford, Conn., both in the U. S. A.

425,656. Chemical Compounds of the General Formula:



Where R Is the Divalent Aliphatic Hydrocarbon Radical, X Is a Halogen from the Class of Chlorine and Bromine, and n Is an Integer at Least 1 and not More Than 5. Canadian General Electric Co., Ltd., Toronto, Ont., assignee of G. F. D'Alelio, Pittsfield, Mass., U. S. A.

425,665. Combination of a Base Material Composed of Continuous Filament of Glass Fibers, an Adherent, Elastic Coating of an Oil-Modified Phenol-Aldehyde Resin, and a Thermosetting Phenol-Aldehyde Resin Applied to the Coated Base Material. Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of R. W. Auxier, Wilkinsburg, Pa., U. S. A.

425,678. Plastic Composition Consisting of a Vinyl Resin and a Plasticizer. Carbide & Carbon Chemicals, Ltd., Toronto, Ont., assignee of C. E. Staff and W. N. Stoops, both of Charleston, W. Va., U. S. A.

425,742. Non-Blooming Rubber Hydrochloride Film Elasticized with Dibutyl Phthalate and Dibutyl Sebacate. Wingfoot Corp., assignee of G. W. Ferner, both of Akron, O., U. S. A.

425,743. Reducing Acrylonitrile to Propionitrile by Hydrogenation under Pressure in the Presence of Raney Nickel as Catalyst. Wingfoot Corp., Akron, O., assignee of C. F. Winans, Pittsburgh, Pa., U. S. A.

United Kingdom

566,202. Copolymers of Vinylethinylcarbinols and Acrylic-Type Esters. Imperial Chemical Industries, Ltd.

566,206. Copolymers. E. I. du Pont de Nemours & Co., Inc., and L. A. Burrows.

566,308. Esters of Hydroxydihydronorpolycyclopentadienes. Resinous Products & Chemicals Co.

566,327. Bonding of Abrasive Particles. Bakelite, Ltd.

566,344. Polymerization of Allyl-Type Primary Alcohols and Products Obtainable thereby. Shell Development Co.

566,347. Water-Soluble Melamine-Formaldehyde Resins. American Cyanamid Co.

566,388. Gelatinization of Polyvinyl Compounds. A. Burness, C. L. Child, J. W. Davison, and Imperial Chemical Industries, Ltd.

566,412. Diolefins. Standard Oil Development Co.

566,497. Copolymerization. Wingfoot Corp.

566,532. Organic Isocyanates. Wingfoot Corp.

566,712. Halogenated Hydrocarbon Compositions. British Thomson-Houston Co.

566,760. Adhesive Compositions. S. A. Leader.

566,783. Chlorinated Hydrocarbons. E. I. du Pont de Nemours & Co., Inc.

566,789. Union Active Resinous Condensation Products. American Cyanamid Co.

566,792. Cements from Synthetic Resins. Ford Motor Co., Ltd.

MACHINERY

United States

2,368,908. Gasket Cutter. C. H. Witter and M. J. Welter, Seneca, Ill.

2,369,553. Extruder. R. T. Fields, Arlington, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,369,636. Apparatus for Molding Loop Pickers. H. M. Bacon, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,369,858. Apparatus to Form Insulated Cable. A. O. Ryan, River Edge, assignor to Federal Telephone & Radio Corp., Newark, both in N. J.

2,369,998. Tire Building Apparatus. R. C. Bateman, assignor to Wingfoot Corp., both of Akron, O.

2,370,200. Apparatus for Producing a Gel Product. H. A. Shabaker, Media, Pa., assignor to Houdry Process Corp., Wilmington, Del.

2,370,241. Combination Spot Vulcanizer for Tire Repairing. J. C. Heintz, Lakewood, O.

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The highly developed wetting power, the specific adhesion, and the tack-imparting properties of the Staybelite* Esters can be relied on to put the "bite" in adhesive masses. And it will stay there—for the Staybelite Esters are nonoxidizing, neutral to zinc oxide or other basic pigments, noncrystallizing. Your own tests will show that synthetic rubber adhesives tackified with the Staybelite Esters keep their "bite" longer, age even better than those of natural rubber. Now used in surgical, masking, and transparent tapes, and in emulsion-type adhesives for shoes and cartons, the Staybelite Esters may be useful in your formulations, too. We invite you to explore the possibilities of the Staybelite Esters. Write Synthetics Department, ***HERCULES POWDER COMPANY***, 914 Market Street, Wilmington 99, Del.

HERCULES

STAYBELITE ESTERS

TACKIFYING RESINS FOR SYNTHETIC RUBBER

*Reg. U. S. Pat. Off. by Hercules Powder Co.

SA-53

2,370,294. **Apparatus for Molding a Rubber Face Mask or the Like.** H. M. Dodge, Wabash, Ind., assignor to General Tire & Rubber Co., Akron, O.

2,370,298. **Device to Coat Fabric with Rubber Cement.** M. Engler, assignor to General Tire & Rubber Co., both of Akron, O.

2,370,469. **Organic Materials Extruder.** C. R. Johnston, Glen Mills, Pa., and R. R. Nydegger, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

Dominion of Canada

425,308. **Vulcanizing Unit.** Dill Mfg. Co., Cleveland, assignee of A. E. Bronson, Shaker Heights, both in O., U. S. A.

425,358. **Footwear Vulcanizer.** B. F. Sturtevant Co., Boston, assignee of F. C. Dawson, Canton, both in Mass., U. S. A.

425,413. **Mold for an Auomobile Tire.** Akron Standard Mold Co., assignee of H. C. Bostwick, both of Akron, O., U. S. A.

425,495. **Mold for Shaping Articles from Latex Foam.** United States Rubber Co., New York, N. Y., assignee of W. J. Clayton and J. F. Schott, bo.h of Mishawaka, Ind., U. S. A.

United Kingdom

566,341. **Machine to Form Covers or Casings for Pneumatic Tires.** E. W. Wirt.

566,369. **Apparatus for Producing Sponge Rubber Articles.** R. F. McKay, (United States Rubber Co.)

566,918. **Presses for Molding Plastic Material.** Limit Engineering Co. and A. L. Collins.

566,927. **Means for Heating an Article in a High-Frequency Electric Field.** B. Jablonsky.

UNCLASSIFIED

United States

2,368,617. **Low-Pressure Alarm for Tires.** L. H. Rykken, Mayville, N. Dak.

2,368,672. **Apparatus for Indicating and Controlling the Flow of Solid Materials.** F. J. McNamara, Paulsboro, N. J., assignor to Houdry Process Corp., Wilmington, Del.

2,368,827. **Apparatus to Produce Carbon Black.** H. Hanson, Charleston, W. Va., and R. W. Skoog and L. H. Grisso, Borger, Tex., assignors to United Carbon Co., Inc., Charleston, W. Va.

2,369,413. **Cable Clamp.** L. H. Rusz, assignor to Oxford-Tartak Radio Corp., both of Chicago, Ill.

2,369,697. **Hose Coupling.** T. A. Werkenthin, Arlington, W. Va., and F. M. McGeary, Washington, D. C.

2,369,770. **Snap Ring Lock Coupling.** E. W. Baxter, Bradford, Pa., assignor to Dresser Industries, Inc., a corporation of Pa.

2,369,849. **Joint for Electrical Conductors.** D. M. Phillips, Fullerton, assignor to Chiksan Tool Co., Brea, both in Calif.

2,370,014. **Seat for Farm Implements.** M. M. Cunningham, South Bend, Ind., assignor to Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.

2,370,451. **Tire Valve.** A. E. Dank, Baltimore, Md., assignor to Assembled Products Co., Baltimore, Md.

2,370,496. **Tire Servicing Rack.** H. F. Seip, Waltham, Mass.

Dominion of Canada

425,158. **Flexible Tubing Union.** W. H. Grint, Slough, Buckingham, England.

425,193. **Nickel Electroplating Bath.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. P. ter Horst, Pompton Plains, N. J., U. S. A.

425,412. **Hose Reel.** F. P. Zierden, St. Francis, Wis., U. S. A.

425,536. **Hose Coupling.** Aktiebolaget Elektrolux, assignee of V. V. Bjereus, both of Stockholm, Sweden.

425,575. **Coupling for Linemen's Protective Device.** W. H. Salisbury & Co., assignee of G. F. Salisbury, both of Chicago, Ill., U. S. A.

425,623. **Shut-Off Coupling.** F. J. Heywood, Mill Valley, Calif., U. S. A.

425,687. **Bead Lock for Pneumatic Tire, and Rim Assemblies.** Firestone Tire & Rubber Co., assignee of J. E. Hale, both of Akron, O., U. S. A.

425,689. **Motor Vehicle Wheel.** Firestone Tire & Rubber Co., assignee of W. E. Lyon, both of Akron, O., U. S. A.

425,739. **Indicating System for Use with a Balance Tester.** Weaver Mfg. Co., assignee of C. H. Phelps and I. A. Weaver, all of Springfield, Ill., U. S. A.

425,740. **Vibration and Oscillation Indicator for Use with a Balance-Tester.** Weaver Mfg. Co., assignee of I. A. Weaver and C. H. Phelps, all of Springfield, Ill., U. S. A.

United Kingdom

566,294. **Pressure, Vacuum, or Pressure and Vacuum Gages.** J. Tomey & Sons, Ltd., and A. E. White.

566,426. **High-Voltage Electric Cable Terminations and Joints.** C. J. Beaver, E. L. Davey, J. H. Pirie, and W. T. Glover & Co., Ltd.

566,433. **Pipe or Tube Couplings.** United States Rubber Co.

566,736. **Anti-Skid Devices.** W. H. Linn.

566,748. **Coupling Devices for Pipes or Tubes.** Automotive Products Co., Ltd., and W. H. J. Brock.

566,859. **Means for Securing and Holding Tire Inflators on Cycles, Etc.** F. W. Goulding.

566,931. **Pipe Joints.** Cellacite & British Uralite, Ltd., and H. W. Kingsbury.

566,954. **Pipe Fittings Particularly Applicable to Rubber or Like Flexible Hose.** P. G. Caldwell.

TRADE MARKS

United States

409,870. **Carol Gay.** Clothing including corsets and footwear. Allied Stores Corp., Wilmington, Del., doing business as Bon Marche, Seattle, Wash., Dey Bros. & Co., Syracuse, N. Y., and Quackenbush Co., Paterson, N. J.

410,018. **Belle Smith.** Corsets, etc. Belle Smith Brassiere Co., Brooklyn, N. Y.

410,595. **Metaseal-Pak.** Merchandise envelopes. Ivers-Lee Co., Newark, N. J.

410,656. **Hawaiian.** Artificial bait. F. Arbogast, Akron, O.

410,658. **Lindor.** Girdles, etc. J. Liverart, Montreal, P. Q., Canada.

410,665. **"Timmy" the Turtle.** Toys. Firestone Tire & Rubber Co., Akron, O.

410,666. **Peter the Penguin.** Toys. Firestone Tire & Rubber Co., Akron, O.

410,711. **Deflect-O-Gauge.** Tire air pressure gage. General Tire & Rubber Co., Akron, O.

410,882. Representation of a label containing the words: **"American Viscose Corporation"** and the representation of a shield containing the letters: **"AVC."** Elastic yarns and threads. American Viscose Corp., Wilmington, Del.

410,940. **Unads.** Accelerator. R. T. Vanderbilt Co., Inc., New York, N. Y.

410,945. Representation of a dog atop a tire containing the words: **"A 'Dog-on' Good Tire."** Recapped tires. A. L. Tanner, doing business as Tire Service Center, Santa Cruz, Calif.

410,964. **Quick-On.** Footwear. Ettelbrick Shoe Co., Greenup, Ill.

410,981. Representation of a mask above the words: **"Joseph Antell."** Footwear. J. Antell, Brookline, Mass.

410,983. **Randfilm.** Baby pants. Rand Rubber Co., Brooklyn, N. Y.

410,984. **Randfilm.** Crib sheets and waterproof sheeting. Rand Rubber Co., Brooklyn, N. Y.

411,019. Representation of a nameplate with the letter: **"V"** and the word: **"RawnSello"** across it. Raincoats and other articles of clothing. S. H. Rawnsley, Ltd., Bradford, Yorkshire, England.

OBITUARY

H. Archibald Mayse

H. ARCHIBALD MAYSE, for 25 years vice president and treasurer of The H. O. Canfield Co., Bridgeport, Conn., died February 19 at his home in Southport after a long illness.

Born in Emporia, Kan., September 17, 1873, and educated in Washington, D. C., he came to Bridgeport in 1898 as representative of the American Graphophone Co. He became affiliated with the Canfield company in 1901, becoming superintendent in 1907, assistant treasurer in 1914, secretary the following year, and vice president and treasurer in 1916, which positions he held until he retired in November, 1941, because of ill health.

The deceased was associated with the Masons and was a member of the Pequot Yacht, Brooklawn Country, Comedy and Allgonquin clubs.

Mr. Mayse is survived by a wife, a son, a grandson, and a sister.

Funeral services were held at his residence on February 21, followed by cremation at Ferncliffe, Greenburgh, L. I.

Ned R. Cadot

NED R. CADOT, 39, assistant personnel director for The Goodyear Tire & Rubber Co., Akron, O., died March 2 following an illness of three months. In 1928, two years after graduating from Ohio State University, Mr. Cadot became affiliated with Goodyear squadron training, then transferred to efficiency. In February, 1941, he was made manager of the factory employment division and a short time later became personnel manager of the Los Angeles plant. Mr. Cadot returned to Akron the next year as labor division manager and in March, 1943, was appointed manager of the efficiency division. He was named assistant to R. S. Pope, director of personnel, in July, 1944.

Funeral services were held March 5 at the Billow Chapel, and interment followed at Rose Hill Cemetery, Akron.

Surviving are the wife, a son, a daughter, his parents, and a brother.

Morris Barbanell

A HEART ailment caused the death, on February 10, of Morris Barbanell, president of M. Barbanell, Inc., 80 Broad St., New York 4, N. Y. Before forming his own concern on November 8, 1938, he had been previously connected with the New York Paint & Varnish Co., Fred Dunbar & Co., and head of the crude rubber department of Hermann Weber Co.

The deceased was also a member of the Masons, Elks and the Woodmere Country Club.

He was born in Brooklyn, N. Y., in May, 1894.

Funeral services were held February 14 at the Park West Memorial Chapel, New York, following which, he was buried in Long Island.

He is survived by a wife and two sons.

CALENDAR

Apr. 3.	**Los Angeles Rubber Group, Inc. Mayfair Hotel, Los Angeles, Calif.**
Apr. 9-10.	**Midwest Power Conference. Palmer House, Chicago. (Cancelled—ODT.)**
Apr. 9-10.	**Industrial Accident Prevention Associations. Safety Convention. Royal York Hotel, Toronto, Ont., Canada.**
Apr. 13.	**Rubber & Plastics Division, Montreal Section, S. C. I. Ritz-Carlton Hotel, Montreal, P. Q., Canada.**
Apr. 13.	**New York Rubber Group. Building Trades Club, New York, N. Y.**
May 1.	**Los Angeles Rubber Group, Inc. Mayfair Hotel, Los Angeles, Calif.**
May 14-June 30.	**Seventh War Loan Drive.**
May 18.	**Chicago Rubber Group. Morrison Hotel, Chicago, Ill.**
May 20-26.	**National Cotton Week.**

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FAR EAST

CEYLON

Thanks to strenuous last-minute efforts, Ceylon was able to fill her quota for the third quarter of 1944, and the price of rubber for the succeeding quarter thus remained unchanged. Under the existing scheme, which is to continue in force until the end of June, the price of rubber depends on the output; if growers fail to produce the quota for a given quarter, the price is lowered. On the whole, planters did their best to make the quota. But, according to the Rubber Commissioner of Ceylon, some were hoping that the quota would not be reached and that the price would be reduced for the final quarter of 1944, as they expected thereby to defeat proposals to raise wages of laborers on the estates.

The basic wages for laborers on tea and rubber estates ranged from 53 to 57 rupee cents a day, depending on locality. Because of the steep rise in the cost of living since the war, laborers have been receiving in addition a cost of living allowance based on the cost of living index so that in the latter part of 1944 the total rate per day came to about one rupee. The wages boards of the two industries decided it was time to raise pay again, and first reports put the new wage at the uniform rate of 1.25 rupees a day; later reports gave the figure as 1.50 rupees a day. Owners of rubber and tea estates protested in London to the Secretary of State for Colonies stating that the proposed 1.50 rupees a day had no relation to the fixed price paid for tea and rubber by the government and that the wage had not been determined in relation to the cost of living index, but as the result of an effort to raise the standard of living of agricultural laborers. The Secretary of State is understood to be taking up the matter.

But, later, despite the urgings and promptings of the Rubber Commissioner, Ceylon exports for the last quarter of 1944 fell below the quota required to maintain the maximum price; consequently the price for rubber for the first quarter of 1945 was reduced by 4d. a pound.

It is said, however, that in 1944, Ceylon lost at least 10,000 tons of rubber because of abnormally wet weather.

London papers have been discussing the effect of the price cut on British-financed rubber companies in Ceylon, and the view is that since they have to surrender all profits above a certain level for war taxation in any case, the cut will make little difference to them, and only the Ceylonese companies and British companies registered in Ceylon will suffer as a result of the reduced price. It has been pointed out, however, that the main reason why British rubber companies will on the whole not suffer by the price cut is this: Before the scheme for encouraging maximum output by higher prices was introduced, producers had been urged to raise production by so-called "slaughter-tapping" of at least 20% of their total rubber acreage, the government undertaking to compensate planters for the inevitable damage to their trees by granting up to $180 per acre for replanting. Later, producers were

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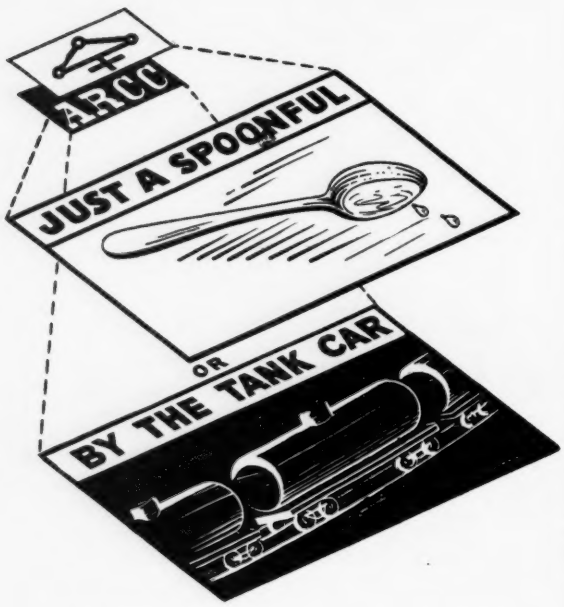

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offered the choice of the higher price level or compensation, and most European companies chose the latter, and therefore had not been benefitting by the higher price anyway.

In the Ceylon press, the point was raised that outputs would be increased if the ban on issuing production figures were lifted. It is argued that if regular publicity is given to the outputs from the different sections, it would clearly be seen what sections were not pulling their weight; at the same time relative yields from old and new trees and the effect of intensive tapping would be revealed. Furthermore, it is emphasized, if the United States Government, now the chief producer of rubber, makes no secret of figures for synthetic rubber production, there seems to be no reason why statistics on outputs of Ceylon rubber should be withheld.

With reference to intensive tapping methods, it seems reasonable to assume that a part of the trees, at least in the oldest rubber areas, must be beginning to react to "slaughter-tapping" by lowered outputs, or drying-up, where they have not already completely succumbed. It is doubtless too early for figures on the amount of replanting that was done in 1944, data that would yield some indication of the trend.

Incidentally, new planting seems to have continued steadily, and British reports state that so far 36,000 acres of new rubber have been added.

BURMA

The progress of the war in Burma naturally raises the expectation that this country will soon be in a position to contribute its share of rubber to the Allied Nations.

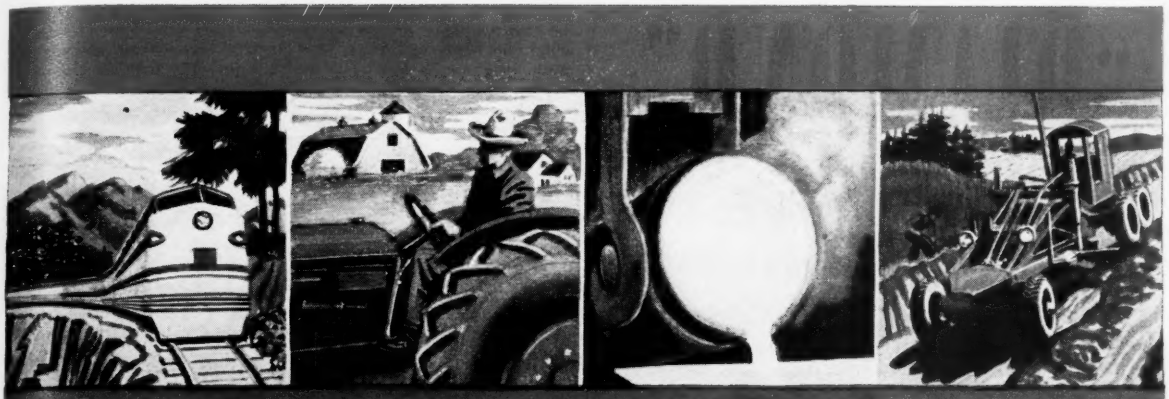
In prewar days Burma was but a minor producer of rubber, with an annual output which in 1938 was estimated at 9,250 tons. The I.R.R.C. in 1940 allowed Burma a basic quota of 13,750 tons, but as H. Ashplant points out in his consideration of Burma rubber prospects in a recent issue of *The India Rubber Journal,* actual production capacity seems to have been nearer the lower figure.

The rubber planting industry in Burma was largely a matter of small holdings owned and operated by Burmese, Indians, and Chinese. The total rubber area of about 105,000 acres was cut up into nearly 4,000 gardens of from one acre to 100 acres, and only 100 estates of more than 100 acres. Of the latter a total acreage of 23,000 was owned by companies registered in London; while another few thousand acres of European-owned rubber were registered in Rangoon.

The average yield per acre of rubber in Burma was low as compared with that obtained from the more important Far Eastern rubber centers, having been not much more than about 200 pounds an acre, although individual European estates could boast of average outputs of 400 and even 600 pounds an acre from their best sections. The low output in Burma was due to various factors. First there was the large proportion of native-owned rubber, some of which was badly managed. Then much of the rubber had been planted in areas unsuitable to *Hevea.* The extremes of the excessively dry season followed by a comparatively wet rainy season also adversely affected yields. Normally the flow of latex is very good in the rainy season, but the heavy and continuous precipitation makes tapping impracticable for weeks at a time. Tapping during the wet season also favors stripe canker, which often causes heavy damage. Finally, the trees in Burma are more or less subject to secondary leaf fall, which has a devitalizing affect resulting in reduced output capacity.

Although Burma, therefore, has never ranked as a rubber producer of any importance, under present conditions the extra amounts of natural rubber that it could contribute would be very welcome. The direction of the present Allied advance suggests that the Rangoon and Moulmein districts, where about half the total rubber lands are situated, will be liberated first. It is thought probable that with abundance of rubber available from Malaya and Netherlands India, the Japanese have not done much tapping in Burma and that the rubber estates have benefitted, rather than otherwise, from the prolonged, enforced rest—provided of course, they have not been sabotaged by the enemy, or there have been no fires in the dry season. At all events it is understood that plans have already been prepared in India toward early resumption of rubber production in Burma as it is liberated.

Mr. Ashplant points out in connection with possible revival of interest in the expansion of rubber planting in Burma, that it would be well worth remembering that the country has large areas of first-class soil eminently suitable for rubber and that, unlike certain sections of Ceylon and India, these territories are almost without exception perfectly level. Burma planters, he adds, have in



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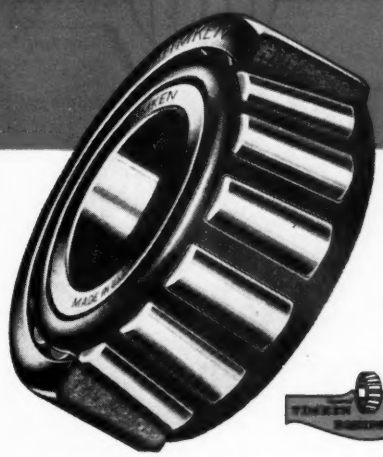

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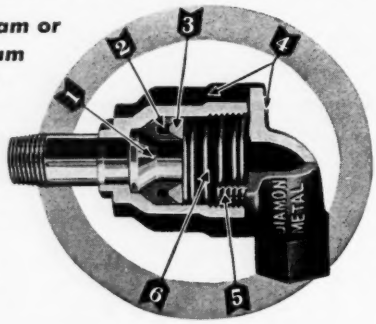

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INDIA

Recent remarks by the Viceroy of India, Viscount Wavell, on the need of improved means of communication in that country, especially motor traffic, and the news of the formation of an Indian financed automobile company, give point to an article in the *India Rubber Journal* on India as a consumer of rubber after the war. The writer reminds us first that this war, by stimulating the country's industries and by making the country the main base of war operations against the Japanese—with all that that implies—has changed India from a debtor to a creditor nation. The purchasing power of all classes has been increased, and it is suggested that an outlet for much of the newly acquired wealth will be in purchases of automobiles both for business and pleasure. India has vast areas not yet served by railways, and here motor transport is a necessity; on the other hand Indians love motoring not only for itself, but almost as much for the social prestige automobile ownership gives. Hence, given improved roads, a great increase in the demand for automobiles, and consequently for tires and tubes and other rubber accessories for automobiles, is expected.

But the more prosperous Indians will also use more rubber in other forms, it is believed; and certain goods, like rubber-soled footwear, will appeal to a larger part of the multitudinous Indian public. Since local factories will no doubt fill much of the new demand for rubber goods, manufacturers outside of India will probably not benefit as much by the greater, postwar consumption of rubber goods in India as they might wish; but producers of raw rubber cannot but welcome a development that promises to continue to offer a good additional outlet for their product when the immediate postwar needs of the world have been filled and the possibility of overproduction has to be faced.

AUSTRALIA

In the past few years Australia has supplied hundreds of thousands of tires to the Armed Forces of Australia as well as to Allied Forces in that area, Sir Frank Beaurepaire, head of the Olympic Tire & Rubber Co., Melbourne, Australia, is quoted as saying in a press interview during a recent visit to England. The Australian rubber industry, he explained, has been seriously handicapped by the manpower shortage, but it has nevertheless almost always been able to produce the goods demanded, although strenuous efforts were required to do so. The Olympic Company has been doing its share in supplying goods for the war effort. A new reclaiming factory has been set up, and in 1940 the production of field telephone wires and insulated wires and cables for munitions projects was initiated. So far the company has produced more than 2¼ million yards of field telephone wire for Allied Armies, and more than £1,000,000 worth of insulated wires for other essential projects.

Raw material for the rubber industry was at first obtained from Great Britain, but latterly has been suplied under Lend-Lease. Small amounts of synthetic rubber are already being used, and it is expected that the percentage of synthetic rubber included in rubber goods will continue to increase until crude rubber is again freely available.

NEW GUINEA

Although some rubber areas of New Guinea are still occupied by the enemy, a record crop of rubber was produced here in the past year. Papuan plantations yielded more than 600 tons of rubber, an increase of 275 tons over the highest prewar output. Plans are afoot to increase the area under rubber.

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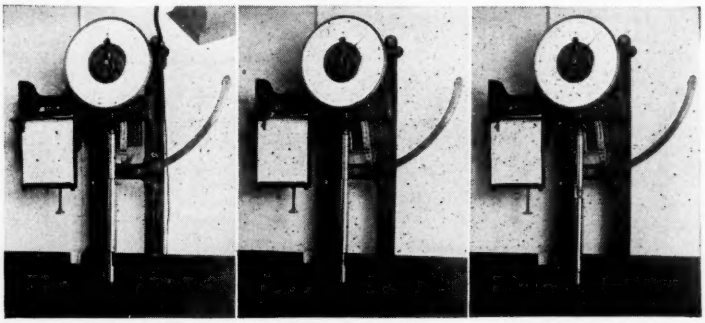

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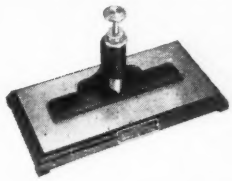

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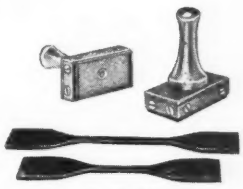

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Editor's Book Table

BOOK REVIEWS

"A Borracha no Brasil." First Series. Amando Mendes. Sociedade Impressora Brasileira, Brusco & Cia., Sao Paulo, Brazil, 1943. Paper, 5 by 7½ inches, 200 pages. Tables. Illustrations.

"A Borracha no Brasil." Second Series. Amando Mendes. Editoria Difusao S/A., Sao Paulo, Brazil, 1943. Paper, 5 by 7½ inches, 196 pages. Tables.

Amando Mendes, well known to his countrymen as a specialist in rubber, began to devote himself to the subject in 1939. In the above two volumes he has collected a number of studies on various aspects of the rubber industry written mainly with the aim of spurring Brazilians on to insure future supplies of raw material for the country's expanding rubber manufacturing industry by giving serious attention to the growing of rubber in Brazil. In some of the articles he discusses the world position of rubber, the present situation and future prospects; in others he gives suggestions on where and how to start plantations and examines the economics of the business both from the point of view of the rubber collector and the contractor or owner. Sr. Mendes believes that the best procedure in Brazil is to plant alternate rows of *Hevea brasiliensis* and *Manicoba* (*Manihot glaziovii* and *Manihot dichotoma*) five meters apart with, between the rows, catch-crops like almonds, soya beans, even rice, cotton or other annual, low-growing crops. He recommends *Manicoba* along with *Hevea* because, as he explains, although the yields are lower and the rubber, while serviceable, is inferior to that from *Hevea*, the tree grows faster than Hevea, and can be tapped in two or three years, thus providing supplies of rubber while Hevea is developing. Furthermore *Manicoba* has the advantage of being resistant to most of the diseases—if not all—that afflict *Hevea*.

Much of the same ground is covered in both books; but older material in the first series is brought up-to-date in the second. It is a pity, however, that when treating—in the first part—early estate practice in the Far East, particularly tapping methods, Sr. Mendes did not make it sufficiently clear that the procedures were outmoded and that recent method were presented in the later series.

"Vocabulario Amazonico. Estudos." Amando Mendes. Sociedade Impressora Brasileira Brusco & Cia., Sao Paulo, Brazil, 1942. Paper. 5 by 7½ inches. 156 pages.

Portuguese, as spoken in Brazil, inevitably bears the imprint of various local influences and, especially among the less educated strata of society, has accumulated a wealth of picturesque colloquialisms and turns of speech quite unintelligible to a student of formal Portuguese, or even to a visitor from Portugal. A comparatively large number of words borrowed from the Tupian, the language of the Tupi Indians of the Amazon Valley, have found a permanent place in the language of the country. Many such words as well as terms and phrases from the patois of the river-folk in Northern Brazil have been collected and explained (in Portuguese) by Sr. Mendes in the "Vocabulario Amazonico." While it by no means claims to be complete, the little work is a distinctly useful contribution to the knowledge of Brazilian Portuguese.

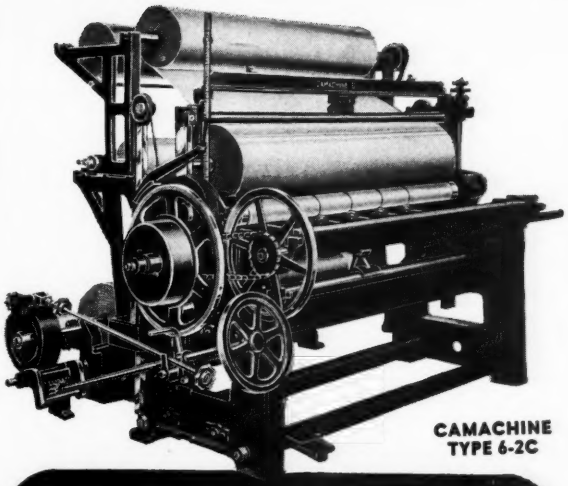
NEW PUBLICATIONS

"The Structure of Polyisoprenes. Part II. The Structure β Gutta Percha." G. A. Jeffrey. Publication No. 55. The British Rubber Producers' Research Association, 48 Tewin Rd., Welwyn Garden City, Herts, England. 8 pages. A complete picture of the atomic arrangements in the crystal lattices is the ultimate goal in studying the crystal structures of the polyisoprenes and can be attained by the synthesis of results from experimental observations on the polyisoprenes themselves and on the substances variously related to them. Subjects covered in this article are: the β gutta percha model, application to the crystal structure and atomic coordinates. The X-ray diffraction data at present available from β gutta percha are insufficient to distinguish the fine details of molecular structure.

"Some Aspects of the American Chemical Industry." Henry F. Palmer and George E. P. Smith, Jr. The Firestone Tire & Rubber Co., Akron, O. 56 pages. The treatment of this subject in this bulletin is of a semi-technical nature and is quite comprehensive. The material was presented as a paper before the Southwestern Chamber of Commerce Institute for Commercial Organization Executives in Dallas, Tex., on July 28, 1944. Under "growth of the chemical industry" a differentiation is made between "chemical industries" and "chemical process industries"; the rubber goods manufacturing industry is placed in the latter class. It is pointed out that the new synthetic rubber industry is typically a chemical industry, expanded in the emergency at a faster rate than that of any previous chemical development. Included in the "summary" are statements that: (1) "The chemical industry has shown remarkable growth, and it has the means by which its growth may be extended; that is, by continuous research and by the commercial development of new products and processes." (2) "The American chemical industry has met the challenge of World War II for new products, new processes, and expanded production. At the end of the war, there is little doubt that in serving all other American industry, the American chemical industry will be *the basic industry* of the American industrial economy."

"Electron Microscope Studies of Colloidal Carbon in Vulcanized Rubber." Vol. V., No. 6. Columbian Carbon Co., 41 E. 42nd St., New York, N. Y. 12 pages. A description of new techniques for electron microscopy colloidal studies in vulcanized natural and synthetic rubber is given. These techniques determine the micromorphology of carbon reenforced rubbers, assess the effect of differences in carbon fineness and structure, evaluate visually the effect of polymer differences on the ultimate carbon polymer units, and determine the effect of processing and other variables. One difficulty in electron microscope studies is the preparing of specimens thin enough for penetration by the electron beam. Attention is given to separate investigations of carbon and rubbers. Three techniques are discussed—the rub out technique, the replica method, and the vulcanizing method, which is the most successful of the three and gives the best pictures. The material presented is reprinted from *Analytical Edition, Industrial and Engineering Chemistry,* 16, 642, 1944.

"The Consulting Chemist and Your Business." 1944 Edition. Foster D. Snell, Inc., 305 Washington St., Brooklyn 1, N. Y. 20 pages. The full scope of the Foster D. Snell laboratories is given, and each phase is discussed in some detail. The booklet contains many photographs, each selected to illustrate a certain type of work done in these laboratories. Rubber and plastics research, fields of work, development of new products, organic synthesis, analytical service, physical testing, bacteriological services, clinical studies, physiological work, plant inspections, vitamin assay, chemical engineering service, surveys, reports, and current information service are some of the topics covered in this publication.



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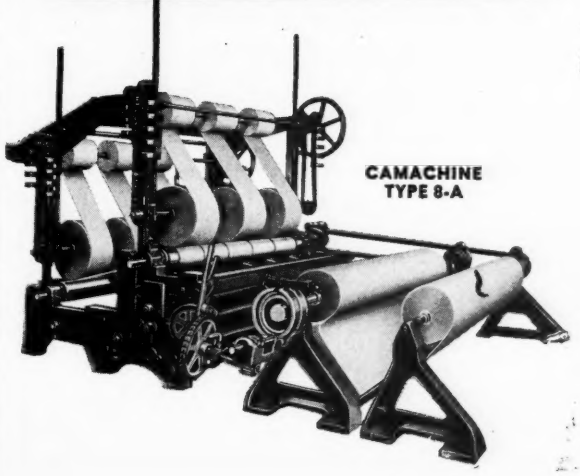

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"Continex SRF in Oil Resistant and Butyl Synthetic Rubbers." Technical Bulletin #45-1. Witco Chemical Co., 295 Madison Ave., New York 17, N. Y. This booklet is a discussion of the properties imparted to GR-M, Hycar OR-15, and GR-I synthetic rubbers by Continex SRF dispersed in GR-M, GR-I, Hycar OR-15; natural whole-tire reclaim and GR-S-reclaim blends are fully discussed. The booklet forms a continuation of the work on Continex SRF reported in Bulletin #44-3 of May, 1944.

Bulletin #45-1 has a great number of tables and graphs, some of the major ones are: loadings of Continex SRF in GR-M, GR-I, Hycar OR-15, and reclaim.

"'Precision' Safety Heaters." Bulletin HP-1650. Precision Scientific Co., 1750 N. Springfield Ave., Chicago 47, Ill. 4 pages. This booklet presents a description of safety heaters for laboratory use. They are especially recommended where a prime consideration is the heating of glassware involving distillation columns, flasks, delicate reflex condensers, and other costly glassware. The features of the heaters, in addition to a time and temperature chart, are also included.

"B. F. Goodrich Multi-V Belts" and **"Fractional Horsepower V-Belts."** Catalog section H 2170 and 2181, respectively. The B. F. Goodrich Co., Akron, O. 2 pages each. The former booklet describes the construction of the belt and the different types of V-belts and gives a comparison and consumer price table. The latter booklet describes the construction of the fractional horsepower V-belts, lists complete V-belt catalogs available and, in addition, includes a table of standard FHP V-belt prices.

"Vanderbilt Materials—Their Use in GR-S." Booklet No. 8. R. T. Vanderbilt Co., Inc., 230 Park Ave., New York 17, N. Y. 20 pages. This laboratory report presents in compact form the properties of Vanderbilt rubber compounding materials, accelerators, antioxidants, plasticizers, fillers, etc., and their functions and uses in GR-S. Included is a comparison of tensile, modulus, elongation, tear resistance, resilience, and compression set of 21 fillers in GR-S, for three different loadings, presented in tabular form.

"South American Leaf Blight of Hevea Rubber Trees." Technical Bulletin No. 882. January 1945. United States Department of Agriculture, Washington, D. C. 32 pages. The Para rubber tree, *Hevea brasiliensis,* has long been the world's foremost source of natural rubber. This plant is adaptable to the soil and climate of vast areas in Mexico, Central America, and South America, but, despite these factors favoring a rubber growing industry in tropical America, most early *Hevea* rubber growing enterprises there ended in failure. The devastating attacks of the South American leaf blight caused by the fungus *Dothidella ulei* has been one of the unfavorable biological factors. This booklet, supplementary to Circular No. 686 of the Department of Agriculture, "Fungicidal Control of South American Leaf Blight of *Hevea* Rubber Trees," describes a cooperative rubber planting program, a blight control program, distribution, damage, fungus, host, and environment. Photographs of the leaf blight conidia and leaf blight ascospores in water in the ungerminated and in the germinated stages are included. A table shows the relation of length of incubation period to the number of lesions incited on young *Hevea* seedlings inoculated with conidia of *Dothidella ulei.* At an incubation period of eight hours, there is approximately one lesion per leaf, but as the incubation period increases, there is a very sharp increase in the lesions per leaf. This bulletin is in effect also a supplement to a 1942 article in INDIA RUBBER WORLD, titled "*Hevea* Rubber Culture in Latin America" and written by R. D. Rands, Special Rubber Investigations, Bureau of Plant Industry, United States Department of Agriculture.

"Classified Directory—1945." Ninth Edition. Association of Consulting Chemists & Chemical Engineers, Inc., 50 E. 41st St., New York 17, N. Y. This latest 108-page directory lists about 100 fields of chemistry and engineering and is divided into three sections. The first contains the key sheet and index. The second section has a scope sheet of members, their qualifications, and particular field of activities. The indices of companies with which members are affiliated are listed in the third section. An innovation is that these companies have been listed in the membership index as well as in the geographical location index.

"Chemicals for Industry." Hercules Powder Co., Wilmington, Del. 16 pages. **"Postwar Highway Traffic."** W. S. James. Institute of Traffic Engineers, 60 John St., New York, N. Y. 4 pages. **"List of Inspected Fire Protection Equipment and Materials."** January, 1945. Underwriters Laboratories, Inc., 207 E. Ohio St., Chicago 11, Ill. 176 pages.

RUBBER BIBLIOGRAPHY

Effect of Light Intensity and Nutrient Supply on Growth and Production of Rubber and Seeds by Guayule. J. W. Mitchell, A. G. Whiting, and H. M. Benedict, *Botan. Gaz.*, 106, 83-95 (1944).

Winter Hardness in Guayule. J. W. Mitchell, *Botan. Gaz.*, 106, 95-102 (1944).

Magnetic Anisotropy of Certain Organic Substances with a Fibrous Structure. E. Cotton-Feytis and E. Fauré-Frémiet, *Compt. rend.*, 214, 996-98 (1942).

Polymerization Reactions of Dienes. V. Polymerization of Isoprene by Bleaching Earths. Preparation of an Aliphatic Diisoprene. T. Wagner-Jauregg and T. Lennartz, *Ber.*, 76B, 1161-65 (1943).

Bakelite Resins in Postwar Coatings. K. V. McCullough, *Paint Ind. Mag.*, 59, 336, 338-40, 342 (1944).

The Selection of Industrial Rubber. I. H. Such, *Steel*, 115, 23, 112-15, 156-64 (1944).

Testing Methods of Metal-Bonded Rubber. S. Buchan, *Engineering*, 158 281-84 (1944).

Preemergence Losses and Seedling Root Rot and Their Control in Guayule Nurseries. B. Sleeth, *Plant Disease Reptr.*, 28, 954-55 (1944).

Drying Oils from the Point of View of a Plastics and Rubber Chemist. W. S. Penn, *Paint Manuf.*, 14, 271-75 (1944).

By-Products of the Cellulose Industry. T. Lassenius, *Finnish Paper Timber J.*, 26, 73, 85 (1944).

The Postwar Strategic Importance of Synthetic Rubber. R. F. N. Pickett, *Rubber Age (London)*, Nov., 1944, pp. 224, 226.

Synthetic Rubber Can Be Made in Britain. J. Gordon, *Rubber Age (London)*, Nov., 1944, pp. 219-20, 232; Jan., 1945, p. 271; Feb., p. 310. (Conclusion.)

Reenforcement of Natural and Synthetic Rubber. Effect of Particle Size of Channel Blacks. L. H. Cohan and M. Steinberg, *Rubber Age (London)*, Nov., 1944, pp. 275, 277-78, 284.

Metallurgical Progress and the Rubber Industry. *India Rubber J.*, Dec. 30, 1944, pp. 6-9.

Photovulcanization. A Study of the Products of the Action of Light on Rubber under Conditions Precluding or Restricting Oxidation Degradation. H. P. Stevens, *India Rubber J.*, Jan. 6, 1945, pp. 3-4, 6-7; Jan. 13, pp. 3-6; Jan. 20, pp. 3-4, 6-7; Jan. 27, pp. 3-5; Feb. 3, pp. 4, 6-7.

Plastics as Alternatives to Rubber for Proofing Purposes. A. Ryan, *Trans. Inst. Rubber Ind.*, Oct., 1944, pp. 77-80.

Rubber Die Technique. G. B. Burnside, *Trans. Inst. Rubber Ind.*, Oct., 1944, pp. 81-92.

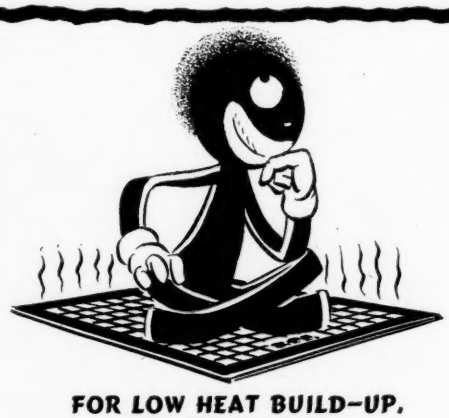
Mastication and Rate of Set-Up. H. S. Buchan, *Trans. Inst. Rubber Ind.*, Oct., 1944, pp. 93-100.

Comparison of Abrasion Resistance with Other Physical Properties. F. N. Upham, *Trans. Inst. Rubber Ind.*, Oct., 1944, pp. 101-102.

What's Ahead for the Tire Industry. *Tire Rebuilders News*, Jan., 1945, pp. 16-17, 19-20, 42.

Army Tire Demand Again Cuts Civilian Supply. *Tire Rebuilders News*, Jan., 1945, pp. 22, 24.

Dichlorostyrenes and Their Polymers. J. C. Michalek and C. C. Clark, *Chem. Eng. News*, Sept. 25, 1944, pp. 1559-63.



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Market Reviews

COTTON & FABRICS

NEW YORK COTTON EXCHANGE
WEEK-END CLOSING PRICES

Futures	Jan. 27	Feb. 24	Mar. 3	Mar. 10	Mar. 17	Mar. 24
July ..	21.06	21.68	21.80	21.74	21.79	21.73
Oct. ..	20.26	21.13	21.22	21.15	21.18	21.10
Dec. ..	20.28	21.06	21.12	21.08	21.09	20.99
Jan. ..	20.24	21.01	21.06	21.03	21.03	20.93
Mar. ..	20.12	22.05	22.14	22.03	20.99	....
May ..	20.04	21.98	20.92	22.00	20.90	22.02

THE March cotton market was notable because of rapid price fluctuations of the 15/16-inch spot middling prices. The price of 21.44¢ on March 2 jumped to 22.47¢ on March 5 and 22.54¢ March 6. The cotton futures had to cope with hedge selling and liquidation. Favorable war news and uncertainty over futures price control caused scattered liquidation. The 22.54¢ figure of March 6 dropped to 22.35 on March 9. Nervous liquidation and profit taking pared early gains when it became known that Marvin Jones, War Food Administrator, had recommended to the Senate Banking and Currency Committee that the purchase program be eliminated and the two priced system be established under which cotton would compete with the foreign variety in the world markets.

The spot price on middling rose again to 22.39¢ on March 16. From March 20 to March 22, there was a slow rise in the price, starting with 22.43¢ to 22.48 on the 22nd. The spot price on 15/16-inch middling cotton closed at 22.50¢ on April 4.

According to the Bureau of Agricultural Economics, the carry-over of cotton last August was 10,600,000 bales, and next August the carry-over is expected to exceed this figure. The Census Bureau consumption report for February, issued March 15, shows cotton consumption in February totaled 781,559 bales of lint and 119,308 of linters compared with 849,945 and 128,781 in January and 811,062 and 107,262, respectively, in February, 1943. Consumption for the seven months ending February 28 totaled 5,658,740 bales of lint and 863,106 of linters, contrasted with 5,902,178 and 759,433 a year ago at the corresponding period.

Fabrics

At the beginning of March, scattered sales were made on high priorities in the carded goods section of the gray cloth market. As a whole, the market remained sold up as far as it would go; this is generally through April. It was indicated by many houses that activity beyond April would not be forthcoming for several weeks. Reasons for this were: the WLB decision on a 55¢ per hour minimum wage, stronger indications of ceilings being rolled back when removed from the interim basis, and a declining production rate due to manpower problems. Toward the middle of the month sales were dormant, and the market tightened. The tight market was hit by new military and essential needs.

Manufacturers of high-tenacity rayon yarn are permitted by Amendment 7 to MPR 167—Rayon Yarn and Staple Fibre—effective March 22, to apply for ceiling price increases covering the higher cost of producing this yarn with converted or newly constructed equipment. The amendment applies only to manufacturers operating under WPB directions and provides for an adjusted price equal to the average cost of the applicant's production on converted or newly constructed equipment. It replaces a former amendment which covered only 1, 100-denier high-tenacity rayon yarn and permitted price increases only where the ceiling failed to meet the total average cost of all the applicant's production of that yarn.

The action was taken so that manufacturers could continue to produce without financial loss, OPA said. The latest WPB program calls for production of 296 million pounds of high-tenacity rayon yarn a year, against the 1941 output of 23 million pounds. The five producers subject to WPB direction gradually have converted their facilities and now are making two-thirds of their high-tenacity yarn on converted equipment. Because these facilities are not well adapted to high-tenacity yarn, and because conversion itself is expensive, the higher cost of operation in some cases has eliminated all profit on the yarn. Yarn produced with newly constructed equipment is included in the adjusted price provision because of the possibility that the equipment's useful life may be shorter than normal, cutting down the time available to the manufacturer for paying off the cost of this equipment.

Amendment 7 was recommended by an OPA Board of Review which heard one producer's appeal from an adverse OPA decision on his request for a price increase. The board denied his application, but recommended a change in the price adjustment provision.

New York Quotations March 23, 1945

Drills		
38-inch 2.00-yard	yd.	$0.195
50-inch 1.52-yard		.29
52-inch 1.85-yard		.23875
52-inch 2.20-yard		.20511
59-inch 1.85-yard		.25202
Ducks		
38-inch 2.00-yard S.F.	yd.	.22875
40-inch 1.45-yard S.F.		.30172
51½-inch 1.35-yard D.F.		.33875
72-inch 1.05-yard D.F.		.45476
Mechanicals		
Hose and belting	lb.	.4225
Tennis		
51½-inch 1.35-yard S.F.	yd.	.33148
51½-inch 1.60-yard D.F.		.29218
Hollands — Rubber		
20-inch	yd.	.1225/.145
30-inch		.22 /.2575
40-inch		.245 /.29
Osnaburgs		
36-inch 2.94 Cl.	yd.	.1271
40-inch 2.11 P.W		.1623
40-inch 2.65 Cl.		.1408
40-inch 3.65 Cl.		.10273
Raincoat Fabrics		
Cotton		
Bombazine 64 x 60, 5.35	yd.	.135
Bombazine 64 x 56, 5.50		.1325
Print cloth, 38½-inch, 64 x 60		.09439
Sheeting, 40-Inch		
48 x 48, 2.50-yard	yd.	.172
64 x 68, 3.15-yard		.14761
56 x 60, 3.60-yard		.12638
44 x 40, 4.25-yard		.10352
Sheetings, 36-Inch		
48 x 44, 5.00-yard	yd.	.091
40 x 40, 6.15-yard		.07398
Tire Fabrics — Karded Peeler		
Builder		
17¼ ounce 60" 23/11 ply	lb.	.48
Chafer		
14 ounce 60" 20/8 ply	lb.	.48
9¾ ounce 60" 10/2 ply	lb.	.45
Cord Fabrics		
23/5/3, 1/8" cotton	lb.	.44
15/3/3, 1/8" cotton	lb.	.42
12/4/2, 1/8" cotton	lb.	.42
23/5/3, 1¼" cotton	lb.	.44
Leno Breaker		
8¼ ounce and 10¼ ounce 60"	lb.	.45

SCRAP RUBBER

IN THE scrap rubber market demand continues to soar, with supply remaining at a relative standstill. No immediate changes are seen. An increased demand for tire parts, especially, has been noted in the last month.

The year-end report of the WPB Rubber Bureau indicates that the scrap-yards of Rubber Reserve Co. will shortly have completed distribution of the more desirable types of scrap rubber. There is, however, a substantial inventory position in the hands of the reclaiming industry which should insure full-scale operation for at least another year.

Existing maximum prices for scrap tires, mixed lots of scrap and repairable tires, and miscellaneous scrap rubber that includes any scrap tires have been extended to cover all sales, by Amendment 12 to RPS 87—Scrap Rubber—and Order No. 33 under Supplementary Order No. 94—Special Maximum Prices for Scrap Whole Pneumatic Tire Casings—both effective March 10, 1945. Previously these ceilings had applied only to sales to industrial consumers. This action affects chiefly sales by dealers in scrap tires and in used tires. The sales are generally made to other dealers and to reclaimers, but not, as a rule, to the general public. Heretofore sales other than to industrial consumers were exempt from price control. This extension, made after consultation with leading scrap rubber dealers and with the Reclaimed Rubber Manufacturers' Industry Advisory Committee, will strengthen OPA's control over used and repairable tire prices at the wholesale level. Owing to the scarcity of used and repairable tires, prices paid in recent months have exerted pressure on retail ceilings for used tires, OPA said.

The ceilings are on a delivered basis for civilian sales and are f.o.b. shipping point for sales by the Army, Navy, and the Procurement Division of the Treasury Department. The extended ceilings for scrap tires, as well as for mixed lots of scrap and repairable tires, range from $14 to $20 a short ton, depending on the delivery location in the case of civilian sales and the shipping point in the case of Army, Navy, or Treasury Procurement sales. A uniform ceiling of $15 a ton delivered applies to sales of miscellaneous scrap rubber that includes any scrap tires.

The ceilings for mixed lots of scrap and repairable tires are the same as those for scrap tires. Dealers who wish to obtain the higher prices for repairable tires allowed under the repairable tire regulation must segregate and also sell the tires separately.

DUCK

HELPS BREAK THE JAP LAND BLOCKADE OF CHINA

FIRST CONVOY STARTS DOWN THE STILWELL ROAD. At Myetkyina, Burma, Chinese soldiers who fought to open the road greet the first trucks of a convoy of arms and ammunition headed for China. Duck tarpaulin protect the cargo of each truck—duck gun covers keep dust, dirt and water from gun barrels and firing mechanisms.

AS THE CONVOY MAKES UP, tarpaulin covered trucks pass long rows of Jeeps—each with its duck top—in a motor pool at the Burma end of the Stilwell Road.

ONCE IN PLACE AND READY TO GO this 75 mm. gun will be protected by a gun cover made of duck as it takes the long trek down the Stilwell Road to China.

HERE AT HOME all production of our famous Superior Army, Oceanic, Cypress, Sherman, Monarch, Buckeye and Magnolia duck continues to be channeled to the armed services and to those essential industries able to comply with current government directives.

Wellington Sears Company
65 Worth Street, New York 13, N. Y.

WELLINGTON SEARS COMPANY, NEW YORK

Scrap Rubber Ceilings

	¢ per Lb.
Inner Tubes†	
Red passenger tubes	7½
Black passenger tubes	6¾
Truck tubes	6½
Tires‡	**$ per Short Ton**
Mixed passenger tires	20.00
Beadless passenger tires	26.00
Mixed truck tires	20.00
Solid tires	36.00
Peelings†	
No. 1 peelings	52.25
2 peelings	33.00
No. 1 light colored (zinc) carcass	57.75
Miscellaneous Items*	
Air brake hose	25.00
Miscellaneous hose	17.00
Rubber boots and shoes	33.00
Black mechanical scrap above 115 sp. gr.	20.00
General household and industrial scrap	15.00

† All consuming centers except Los Angeles.
‡ Akron only.
* All consuming centers.

RECLAIMED RUBBER

RECLAIMERS are more willing to accept, at a discount, deliveries of scrap having quantities of synthetic rubber. It is expected that the classification committee of the Rubber Reclaimers Association will meet in the near future to determine methods whereby mixed scrap may be graded, sorted, and identified. E. H. Brooks, of Goodyear Tire & Rubber Co., Akron, O., will act as chairman.

Supply of reclaimed rubber remains the same, with manpower a major problem. Demand continues high. The reclaiming industry has made substantial forward strides in the reclaiming of synthetic rubber scrap, and this will undoubtedly prove the insurance policy for continued reclaim operations, according to the year-end report of the WPB Rubber Bureau. Reclaim production will be increased to 25,000 tons a month if WMC can find the manpower to achieve this new goal.

Reclaimed Rubber Prices

	Sp. Grav.	¢ per Lb.
Auto Tire		
Black Select	1.16-1.18	7 / 7¼
Acid	1.18-1.22	8 / 8¼
Shoe		
Standard	1.56-1.60	7½ / 7¾
Tubes		
Black	1.19-1.28	11¾/12
Gray	1.15-1.26	12½/13½
Red	1.15-1.32	12¾/13
Miscellaneous		
Mechanical blends	1.25-1.50	5 / 6

The above list includes those items or classes only that determine the price bases of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

Fixed Government Prices*

	Price per Pound	
	Civilian Use	Other Than Civilian Use
Balata		
Manaos Block	$0.38¾	$0.38¾
Swinam Sheet	.42½	.42½
Guayule		
Guayule (*carload lots*)	.17½	.31
Latex		
Normal (*tank car lots*)	.26	.43½
Creamed (*tank car lots*)	.26¾	.44¼
Centrifuged (*tank car lots*)	.27¾	.45¼
Heat-Concentrated (*carload drums*)	.29½	.47
Plantation Grades		
No. 1X Ribbed Smoked Sheets	.22½	.40
1X Thin Pale Latex Crepe	.22½	.40
2 Thick Pale Latex Crepe	.22	.39½
1X Brown Crepe	.21⅝	.38⅞
2X Brown Crepe	.21⅛	.38¾
2 Remilled Blankets (Amber)	.21¼	.38¾
3 Remilled Blankets (Amber)	.21⅛	.38⅝
Rolled Brown	.18	.35½
Synthetic Rubber		
GR-M (Neoprene GN)	.27½	.45
GR-S (Buna S)	.18½	.36
GR-I (Butyl)	.15½	.33
Wild Rubber		
Upriver Coarse (crude)	.12⅜	.26½
(washed and dried)	.20¼	.37¾
Islands Fine (crude)	.14⅜	.28¾
(washed and dried)	.22½	.40
Caucho Ball (crude)	11⅜	.29¾
(washed and dried)	.19¼	.37
Mangabiera (crude)	.08½	.19¾
(washed and dried)	.18	.35½

* For a complete list of all grades of all rubbers, including crude, balata, guayule, synthetic, and latex, see Rubber Reserve Co. Circular 17, p. 169, May, 1943, issue.

Rims Approved and Branded by the Tire & Rim Association, Inc.

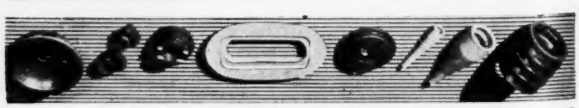
Rim Size	Feb., 1945
15" & 16" D.C. Passenger	
16x4.00E	81,430
16x4.25E	16,941
16x4.50E	43,137
15x5.00E	7,451
16x5.00E	7,436
16x5.00F	3,398
15x5.50F	7,840
16x6.00F	4,060
Hump—16x4.50E	546
15x6-L	3,456
16x6-L	3,684
17" & Over Passenger	
18x2.15B	511
Flat Base Truck	
20x3.75P	1,780
17x4.33R	4,696
20x4.33R	29,024
15x5.00S	7,898
20x5.00S	346,218
24x5.00S	1,591
15x5.50S	1,632
20x5.50S	19,003
15x6.00T	2,972
20x6.00T	118,930
22x6.00T	11,852
24x6.00T	2,332
20x7.00T	1,875
20x7.33V	39,437
22x7.33V	8,690
24x7.33V	13,553
20x8.37V	3,409
24x8.37V	2,705
Semi D. C. Truck	
16x4.50E	4,267
15x5.50F	12,959
16x5.50F	32,539
Tractor & Implement	
15x3.00D	12,869
19x3.00D	12,841
21x3.00D	4,446
20x4.50E	1,772
36x4.50E	306
20x5.50F	18,740
24x6.00S	1,044
24x8.00T	4,335
28x8.00T	2,768
32x8.00T	1,080
40x8.00T	999
W8-24	11,876
W8-32	4,180
W8-38	2,812
W9-28	2,003
W9-38	6,306
W10-24	1,955
W10-28	965
W10-38	1,155
W11-26	8
DW9-38	512
DW10-26	1,138
DW10-38	6,923
DW12-30	1,575
Cast	
24x15.00	162
Total	950,022

FOR GOOD ABRASION RESISTANCE.
USE PHILBLACK A

(FOR FURTHER DETAILS, SEE AD ON PAGE 4)

PHILIP TUCKER GIDLEY
Consulting Technologist Synthetic Rubber
We are equipped to perform all types of physical and chemical tests for synthetic rubber.
Fairhaven Massachusetts

FOSTER D. SNELL, INC.
Our staff of chemists, engineers and bacteriologists with laboratories for analysis, research, physical testing and bacteriology are prepared to render you
Every Form of Chemical Service
304 Washington Street Brooklyn 1, N. Y.



SMALL RUBBER PARTS for WAR CONTRACTS
BLOWN • SOLID • SPONGE
FROM NATURAL, RECLAIMED, AND SYNTHETIC RUBBER
THE BARR RUBBER PRODUCTS CO. SANDUSKY OHIO

GRANDFATHER'S high wheeler — *with solid rubber tires* — was the last word in personal transportation in 1883. Replacing iron rims, the new comfort and safety of rubber tires pointed the way to the growing "Age of Rubber" in which Reclaim has played one of the most essential parts.

U. S. Rubber Reclaiming, a going concern in 1883, is proud of its many "firsts" in the industry . . . especially its establishment, in 1905, of the first scientific laboratory exclusively devoted to research and rigid control of Reclaimed rubber. Out of it have come standardized BUFFALO grades on which hundreds of manufacturers rely for quality and uniformity in their own products.

BUFFALO—which means U. S. Rubber Reclaiming — offers its highly specialized knowledge of Reclaim and its many uses to forward-looking manufacturers. To them, BUFFALO Reclaims present the opportunity for great new strides in design and production of countless post war industrial and consumer articles.

U. S. RUBBER RECLAIMING CO., INC. **PLANTS AT BUFFALO, N. Y.**

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AKRON
Dugan & Campbell
907 Akron Savings & Loan Bldg.

TRENTON
H. M. Royal, Inc.
689 Pennington Ave.

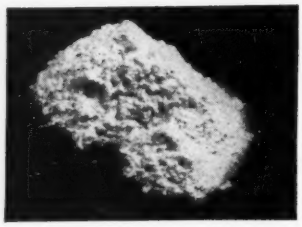
TORONTO
H. Van Der Linde, Ltd.
156 Yonge St.

63 Years Serving The Industry Solely As Reclaimers

RAYCO FLOCK

now widely used to reduce marking in

SOLE COMPOUNDS



In addition to its value for enhancing strength and abrasive resistance, Rayco Filler also has a distinct value in minimizing marking. Applicable to crude, reclaim and synthetic stocks.

Request samples and prices

RAYON PROCESSING CO. of R.I. INC.
102 TREMONT ST., CENTRAL FALLS, RHODE ISLAND
Developers and Producers of Cotton Fillers for Plastics

The H. O. Canfield Co.

MANUFACTURE

Molded Specialties, Plumbers' Rubber Goods, Valves, Gaskets, Hose Washers, and Cut Washers of all kinds

Write for prices and samples

Offices and Works Bridgeport, Conn.
Chicago Office: 424 North Wood Street

ERNEST JACOBY & CO.

Crude Rubber
Liquid Latex
Carbon Black
Crown Rubber Clay

Stocks of above carried at all times

BOSTON MASS.
Cable Address: Jacobite Boston

SCHUSTER CALENDER GAUGE

. . . IT CAN NOW BE EQUIPPED WITH AUTOMATIC CONTROL

NEW—and more valuable than ever. For the past 13 years The Schuster Calender Gauge has proven itself an outstanding and indispensable instrument in the rubber industry. *Now* it automatically adjusts your rolls to a predetermined thickness and correctly maintains that thickness. Coatings for tire fabric and similar uses are kept accurate and uniform *automatically*. The result is a better product at a lower cost. Write us today for complete particulars.

THE MAGNETIC GAUGE COMPANY
60 EAST BARTGES STREET AKRON, OHIO
Eastern States Representative—
BLACK ROCK MANUFACTURING CO., Bridgeport, Conn.

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WE SPECIALIZE IN MOLDS FOR
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LEVI C. WADE CO.
79 BENNETT ST. LYNN, MASS.

FINELY PULVERIZED—BRILLIANT

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THE *New* TINNERMAN **HOSE CLAMP**

This one-piece, ratchet type Hose Clamp is easily latched by hand, then quickly locked with pliers. Removed by prying locking tongue out of ratchet teeth with screwdriver. It weighs less, has a lower profile, exerts uniform pressure, and may be used over and over again. Approved by Army and Navy Air Forces. Sizes from ½" O.D. up. Write for details.

TINNERMAN PRODUCTS, INC.
2132 Fulton Road, Cleveland 13, Ohio

Plan NOW to Speed Up Production

New Laboratory Mills

Two Sizes
6" x 12"
6" x 16"

IF your post war plans for greater production call for special Rubber machinery, we invite you to submit them to Thropp Engineers NOW. They will gladly work with you in designing custom built mills for your particular requirements to enable you to convert quickly to peace time production. Write NOW!

WM. R. THROPP & SONS CO.
Trenton, N. J.

"Rubber—Physical and Chemical Properties"

By
T. R. DAWSON, M.SC., F.I.C., F.I.R.I.,
and
B. D. PORRITT, M.SC., F.I.C., & C.

A Technical Handbook produced by the cooperation of The Rubber Growers' Association, Inc., and The Research Association of British Rubber Manufacturers.

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Cloth, 700 pages, 8½ by 11 inches.

Price $12.50 Postpaid

Above book will be sent postpaid on receipt of remittance.

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Over 400,000 Sold

- Quicker Heating
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- Light Weight
- One Moving Part
- Low Price

Sold by more than 100 Mill Supply Distributors throughout the U.S.A.

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IMPULSE STEAM TRAP

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SPREADING ROOM FOREMAN
with experience in general proofing.

Suburban Boston Area. Permanent postwar position. Must be able to furnish Certificate of Availability.

ADDRESS BOX NO. 910, Care of INDIA RUBBER WORLD.

TIRE CURING FOREMAN—Good opportunity for experienced foreman capable of supervising production in pot heaters and individual vulcanizers. Offers attractive postwar as well as present-day opportunity. Eastern concern. Address Box No. 81, care of INDIA RUBBER WORLD.

TIRE FINISHING SUPERVISOR—Must have experience in supervising all duties connected with cured tire final finishing. Excellent opportunity for advancement with postwar security. Located in Pennsylvania. Address Box No. 82, care of INDIA RUBBER WORLD.

TUBE ROOM SUPERINTENDENT—Must have thorough knowledge of all phases of inner tube manufacture. Opening offers excellent opportunity to man with initiative and ability. Plant located in Pennsylvania. State all qualifications first letter. Address Box No. 83, care of INDIA RUBBER WORLD.

CHEMICAL ENGINEER—COLLEGE GRADUATE PREFERRED—for position in compounding section of progressive manufacturer, producing tires and tubes. Previous experience desirable, but not required. Plant located in Mid-Atlantic area. Complete history of qualifications should be included in letter of application. Address Box No. 84, care of INDIA RUBBER WORLD.

WANTED: SALESMAN WITH TECHNICAL OR CHEMICAL background to cover New York City, New Jersey, and Pennsylvania for well-established firm. Excellent opportunity for right man. When applying state full qualifications. Address Box No. 86, care of INDIA RUBBER WORLD.

NIGHT FOREMAN WANTED. MUST BE THOROUGHLY ACquainted with the manufacture of molded and extruded rubber specialties. New Jersey plant employing 100 employes. Excellent postwar opportunities. Address Box No. 88, care of INDIA RUBBER WORLD.

WIRE AND COMPOUND SPECIFICATION ENGINEER. SOME experience required. Work involves analysis and preparation of specifications, preparation of detailed manufacturing directions. THE WHITNEY BLAKE CO., Hamden 14, Connecticut.

RUBBER COMPOUND MAN. EXPERIENCED WITH SYNTHETIC rubber, preferably wire and cable work. THE WHITNEY BLAKE CO Hamden 14, Connecticut.

CHEMIST—COMPLETE CHARGE OF LABORATORY PRODUCtion control and research on rubber, synthetic rubbers, and synthetic resins for both calendering and spreader work by well-equipped, medium-sized factory established over fifty years in New York City. Address Box No. 89, care of INDIA RUBBER WORLD.

SUPERINTENDENT FOR SMALL ILLINOIS PLANT OPERATING only on synthetic rubbers principally mechanical goods, moldings, extrusions, sheets, calendered stock. Real opportunity for high-grade executive. Give full particulars. Replies held strictly confidential. Address Box No. 90, care of INDIA RUBBER WORLD.

CHEMIST: PROGRESSIVE N. E. MFR. HAS AN OPENING FOR a live man with experience in rubber, pyroxylin, synthetic rubbers and resins as applied to coated fabrics. Permanent position. Write giving details of background and experience, also salary expected, etc. Address Box No. 91, care of INDIA RUBBER WORLD.

RUBBER CHEMIST—Graduate chemist or chemical engineer with broad experience in compounding for molded goods. Responsible position, with excellent postwar opportunities, available with firmly established, progressive eastern company. Reply full details in first letter. Address Box No. 92, care of INDIA RUBBER WORLD.

CHIEF RUBBER COMPOUNDER—Large progressive mechanical rubber goods manufacturer, located in East, has wonderful opportunity for qualified man to direct group of chemists on hose, belting, and molded goods compounding. Essential war work at present, with excellent postwar future. First letter should give full details as to experience, qualifications, salary desired, etc. Address Box No. 93, care of INDIA RUBBER WORLD.

SITUATIONS OPEN (Continued)

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Research laboratory. Essential war work. New York City. Should be a graduate in chemistry or chemical engineering with some experience in compounding of resins and synthetic rubbers for textile coatings, adhesives, or allied fields. These are permanent and postwar positions. Please send outline of training and experience. Address Box No. 85, care of INDIA RUBBER WORLD.

RUBBER TECHNOLOGIST—Wanted by large eastern company manufacturing essential mechanical rubber goods. Excellent opportunity to assume direction over all specification, factory problem, and development work in connection with hose and belting. Good postwar future. Give all details in first letter. Address Box No. 94, care of INDIA RUBBER WORLD.

EXPERIENCED FACTORY MANAGER TO TAKE FULL CHARGE of small rubber factory on Pacific Coast. Must have practical experience in all factory operations and be familiar with the latest methods of processing synthetics; preferably a college graduate in chemistry. For further details address Box No. 96, care of INDIA RUBBER WORLD.

SALESMAN TO REPRESENT MANUFACTURER OF INSULATED wire and cable in the communications and power and light field. Experience desirable, but not essential. Promising postwar future with small progressive company with an established reputation. Address Box No. 103, care of INDIA RUBBER WORLD.

CHEMIST—EXPERIENCE IN MECHANICAL RUBber goods desirable, but not necessary. Experience with synthetics required. Compound development—production control. Excellent opportunity with old-established company. Location N. Y. State. Write giving particulars and salary desired. Address Box No. 105, care of INDIA RUBBER WORLD.

MECHANICAL ENGINEER WITH EXPERIENCE IN MAINTENance of rubber mill equipment, planning, and installation of labor-saving devices required by manufacturer of mechanical rubber goods located in New Jersey. Give full information covering experience, qualifications, and salary desired. Address Box No. 106, care of INDIA RUBBER WORLD.

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WANTED: 3A BANBURY MIXER, CAMELBACK Tuber with Dies, Batch Boxes, Stock Stands, 52" Calender Shells, Horizontal Vulcanizer, 52" Calender Windup Conveyer, Aprons complete for 2—36", 1—42" Mills, Plastics Extruder. CONTINENTAL CHEMICAL CO., Columbia, S. C.

WANTED: COMPLETE RUBBER PLANT EQUIPMENT, INCLUDing Mills, Presses, Pumps, W.&P. or Banbury Mixers, Screens, etc. Send complete description, location, and prices. Address Box No. 101, care of INDIA RUBBER WORLD.

WISH TO PURCHASE HYDRAULIC PRESSES, INJECTION

Molding Machines, Mixers, Mills. Pumps, Vulcanizers, Calenders, Banbury Mixers. No dealers. Address Box No. 107, care of INDIA RUBBER WORLD.

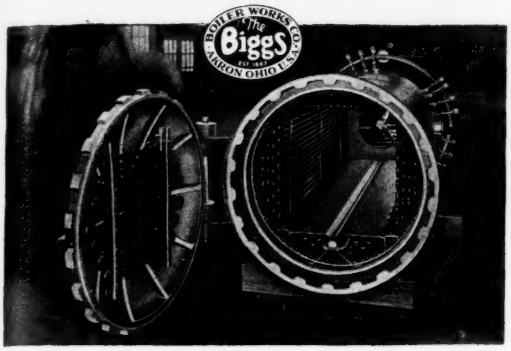
WANTED
BANBURY MIXER

with DRIVE, also MOTOR IF AVAILABLE

This equipment must be in good condition. In answering please specify size, price and age of machine.

Address Box 80, INDIA RUBBER WORLD

(*Classified Advertisements Continued on Page* 120)



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***BIGGS Vulcanizers* are Standard Equipment in the Rubber Industry**

Biggs-built vulcanizers and devulcanizers have always had a prominent place in the development of the rubber industry. For over 45 years Biggs has furnished single-shell and jacketed vulcanizers both vertical and horizontal, as well as many different types of devulcanizers. Biggs modern all-welded units with quick-opening doors are available in all sizes and for various working pressures—with many special features.

Get Bulletin 45

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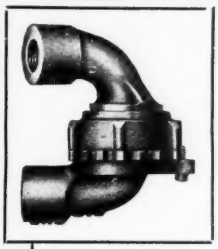

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FLEXO

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"COTTON FLOCKS"

does not mean cotton fiber alone

EXPERIENCE

over twenty years catering to rubber manufacturers

CAPACITY

for large production and quick delivery

CONFIDENCE

of the entire rubber industry

KNOWLEDGE

of the industry's needs

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acknowledged superior by all users are important and valuable considerations to the consumer.

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CLAREMONT WASTE MFG. CO.

CLAREMONT N. H.

The Country's Leading Makers

PALMALENE

A NEW PALM FATTY ACID OF MEDIUM TITRE, SYNTHETICALLY MADE

Excellent as a replacement for Stearic Acid in rubber compounding

PALMALENE SPECIFICATIONS

Saponification Number	180-185
Iodine Value	55-60
Titre	35

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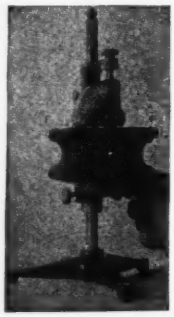

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Hardness • Elasticity
Plasticity of Rubber, etc.
Is the DUROMETER and ELASTOMETER (23rd year)

These are all factors vital in the selection of raw material and the control of your processes to attain the required modern Standards of Quality in the Finished Product. Universally adopted.

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Classified Advertisements

Continued

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: 4—24"x24" Hydraulic Presses, 2—10", 2—12" dia. rams, 2 opening, each complete with valves, gauges, and swing joints. 1—Royle No. 2 Perfection Tuber, motor driven. 1—Farrel heavy-duty 18"x36" Mill with gear reduction and motor. 1—Weighted Accumulator, 5¼" dia. ram, 6' stroke, with 40,000# weights. 1—Allen 6" Tuber. 1—24"x24" Tilting-head Book Press with heated platens. 2—4' dia. x 12' Horizontal Vulcanizers, bolted doors. 1—30"x60" Hydraulic Press, 6 posts each 2½" dia., with 2—25" dia. rams, 8" stroke. 4—W & P Mixers up to 625 gal. cap. 3—30"x24" Hydraulic Presses with 12" dia. rams. 7—High-pressure Hydraulic Pumps, vertical and horizontal, up to 6,000 GPM. Miscellaneous: Steel and cast-iron heated platens, hydraulic piping, valves, mixers, pulverizers, etc. CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York 7, N. Y.

LABORATORY AVAILABLE. Completely equipped modern laboratory and some pilot-plant equipment for research or small-scale production. Prefer cooperative arrangement for going or promising projects. Other combinations, including sale, possible. Location: Long Island City—will consider moving elsewhere. Principals only. Address Box No. 87, care of INDIA RUBBER WORLD.

HYDRAULIC PRESS, TWO OPENINGS, CAST-IRON PLATES 36" x 36", 12" rams, in good condition, with swing joints and valves. MARTIN RUBBER COMPANY, INC., Long Branch, New Jersey.

FOR SALE: 1 VULCANIZER APPROXIMATELY 4' x 4'. BUILT to carry 30 lbs.' air pressure. Address Box No. 98, care of INDIA RUBBER WORLD.

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STOCK SHELLS HOSE POLES
MANDRELS
NATIONAL SHERARDIZING & MACHINE CO.
868 WINDSOR ST. HARTFORD, CONN.
Representatives
Akron San Francisco New York

HYDRAULIC VALVES
Operating, Globe, Angle, or Check Valves—Hydraulic Presses, Accumulators, Pumps, etc.—For almost any size or pressure.
Dunning & Boschert Press Co., Inc.
336 W. WATER ST. SYRACUSE, N. Y.

GUARANTEED REBUILT MACHINERY
IMMEDIATE DELIVERIES FROM STOCK
MILLS, CALENDERS, TUBERS
VULCANIZERS, ACCUMULATORS
HYD. PRESSES, PUMPS, MIXERS
CUTTING MACHINES, PULVERIZERS
UNITED RUBBER MACHINERY EXCHANGE
319-323 FRELINGHUYSEN AVE. CABLE "URME" NEWARK, N. J

(*Classified Advertisements Continued on Page* 122)

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64 YEARS WITHOUT REORGANIZATION

BELTING
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HOSE
for every purpose
Water—Fire—Air—Steam

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for every condition

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(Reg. U. S. Pat. Off.)

For Use with Neoprene

THE STAMFORD RUBBER SUPPLY CO. STAMFORD CONN.

Makers of Stamford "Factice" Vulcanized Oil
(Reg. U. S. Pat. Off.)
SINCE 1900

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FOR EXTENDING RUBBER

SOUTHLAND CORK COMPANY
P. O. BOX 868 NORFOLK, VA.

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PROMPT SHIPMENT

CLINCHFIELD SAND & FELDSPAR CORP.
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Baltimore 2, Md.

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"They Last Longer" REG. U. S. PAT. OFF.

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DRESS SHIELD LININGS	STOCKINET SHEETS
BABY PANTS	RUBBER SHEETS
BABY BIBS & APRONS	RAINCAPES & COATS
SANITARY WEAR	RUBBER SPECIALTIES
RUBBERIZED SHEETING	DOLL PANTS, CAPES, ETC.

RUBBER DAM & BANDAGES — SHEET GUM

RAND RUBBER CO. BROOKLYN, N. Y. U. S. A. MFRS.

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A Non-Rubber Cement for Bonding Synthetic Rubber to Metal, etc.

THE ENERPRENE COMPANY
1910 First Central Tower Akron, Ohio

Top-Quality that never varies!

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Green Chromium Oxides
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Reinforcing Fillers and Inerts

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EASTON, PA.

NEW AND BETTER GAMMETER'S
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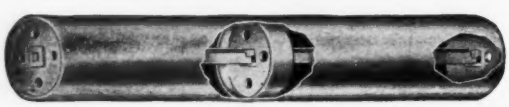

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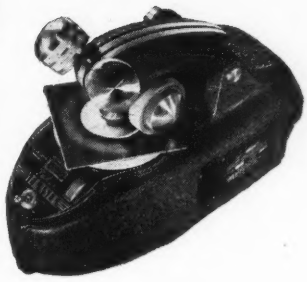

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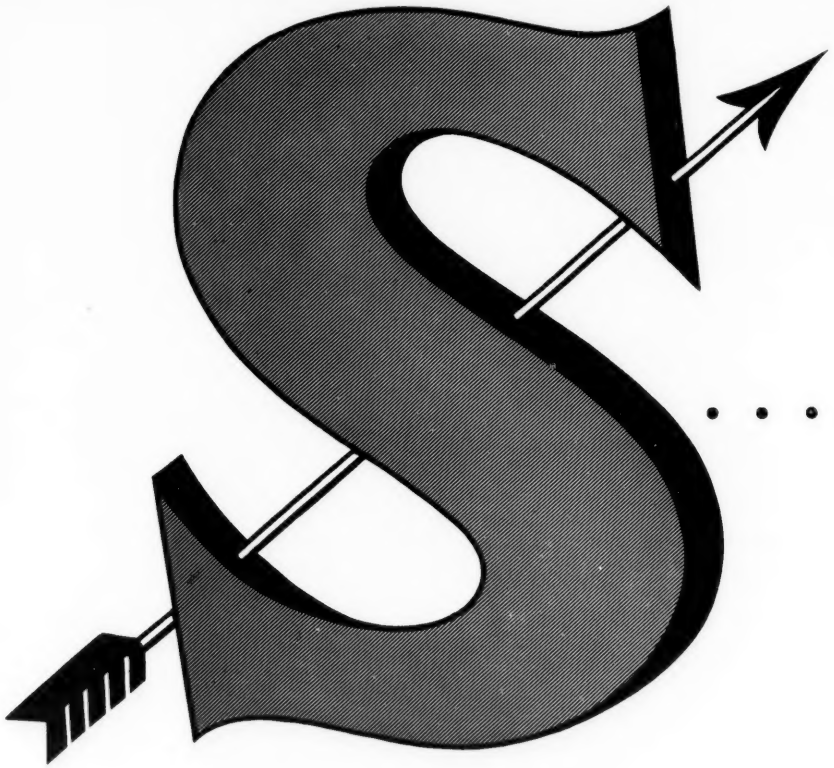

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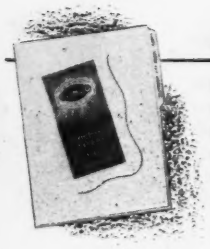

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